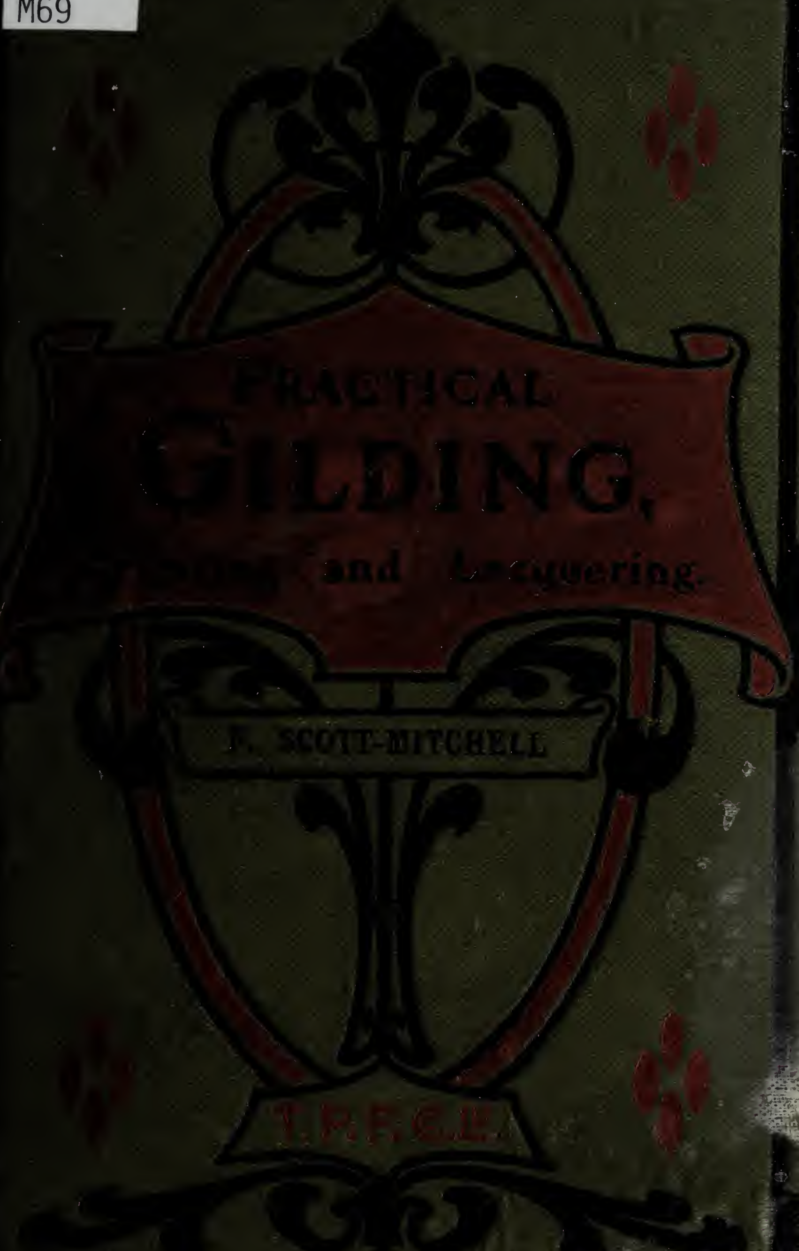
671
M69



PRACTICAL
GILDING,
Bronzing and Lacquering.

F. SCOTT-MITCHELL

T.P.P.C.L.

UNIVERSITY OF ILLINOIS
LIBRARY

Class 671
Book M69
Volume

Return this book on or before the
Latest Date stamped below.

University of Illinois Library

NOV 21 1960
MAY 7 1981
DUE: 12/2/93
JAN 14 1994
JAN 02 1996
Jan 31
3/13
4/18/96
5/22/96
6/23/96
JUN 25 1996

L161—H41

PRACTICAL GILDING,
BRONZING,
AND LACQUERING.

"THE DECORATOR" SERIES OF PRACTICAL HANDBOOKS,

Edited by ARTHUR SEYMOUR JENNINGS.

PRACTICAL GILDING

BRONZING AND LACQUERING.

BY

FREDK. SCOTT-MITCHELL,

Lecturer on Decoration to the City and Guilds of London Institute,
and the London County Council.

London:
THE TRADE PAPERS PUBLISHING CO., LTD.,
365, Birkbeck Bank Chambers, W.C.

1905.

671
71169

EDITOR'S INTRODUCTION.

A SERIES of practical books, of which this is the first, will be published from *The Decorator* Office, because of frequent demands for them from readers and other correspondents.

The Editor has been fortunate in having a very close connection with the painting and decorating trades for over a quarter of a century, and every day brings him inquiries for books of a technical character.

The present work on Gilding may be taken as a fair example of those which will follow. It is thoroughly practical, and as comprehensive as it is possible to make it within the limits of a book published at the popular price of 3/-.

102966

PREFACE.

GILDING, bronzing and lacquering are used in very many trades and crafts. Hitherto there has been no book issued at a popular price dealing comprehensively with these subjects. The writer, who has had many years' of practical experience, now presents his little book in the hope that it will be of service to his fellow craftsmen.

All branches of leaf and powder gilding, silvering, bronzing and lacquering have been included, but the arts of electro-plating and chemical deposit gilding which form in every way a separate and distinct business requiring a totally different plant, tools, and materials, are not dealt with.

The term "gilding," as used in this book, is intended to be taken to cover the application of all metal leaf or powders, whether of gold, silver, bronze, or baser metals, by means of any adhesive vehicle or mordant to fix the metal permanently upon the surface it is intended to embellish.

Wherever mention is made of gold leaf in connection with methods and processes, it may be taken that similar descriptions or instructions would apply to the use of other metal leaves, such as silver, aluminium, Dutch metal, and other substitutes, unless otherwise stated.

F. SCOTT-MITCHELL.

London, July, 1905.

CONTENTS.

CHAPTER I.

MATERIALS.

Metals used in Gilding Processes—Pure Metals—Alloys—Bronze Powders — Colours — Antique — Aluminium Powder—Speckles 13

LEAF METALS.

Gold Leaf—Gold Beating—Colours—Transferred Gold—Handling Gold Leaf—Ribbon Gold—Foreign Gold Leaf—Powder Gold—Shell Gold and Gold Tablets—Platinum Leaf—Silver Leaf—Aluminium Leaf—Tin Leaf—Schlag Metal—Gold Substitutes—Dutch Metal—Ducat Leaf—Aluminium Gold—Imitation Gold—Copper Leaf—Bronze Powders—Gold Paint—To make Bronze Paint 16

MORDANTS.

Old Oil Gold Size—Japanners' Gold Size—Writing Gold Size—Water Sizes—Isinglass Size—Matt Gold Size—Burnish Size—Gum Water—Egg Size—Palmers' Jewelling Cement—Seccotine—Spirit Varnish—Blocking Powders 30

LACQUERS AND SUNDRIES.

Spirit Lacquers—To make Lacquers—Ormolu—Clear Size Finish—Parchment Size—Buffalo Hide Size—Gelatine Size—Glair—Gilders' Clay—Water Scumbles—Oil Lacquers—Black Japan—Sundry Materials—Price List .. 37

CHAPTER II.

TOOLS AND APPLIANCES.

Pounce Bags—Glair—Brushes—Cotton Wool—Gilders' Cushion, Tip, and Knife—Sling Box for Outside Gilding—Skewing Bag—Sponges and Washleathers—Burnishes—Tools for Bronzing—Tools for Lacquering—Price List of Tools 44

CHAPTER III.

PREPARATION OF SURFACES.

Painted Surfaces—"Flatting" Paint—Varnished Paint—Enamelled Wood and Varnished Wood—Plaster and Cement Surfaces—Parian or Keen's Cement—Gesso Work—Relief Materials—Coloured Bronze—Fab-ri-ko-na—Stone, Marble and Granite—Iron and other Metals—Radiators—Natural Wood—Distempered Surfaces—French Polished Work—Paper, Parchment and Cardboard—Picture Frames—Charcoal—Compo—Limitations of Gilding—Carton Pierre—Wire Blinds—Ceilings, Walls, Mouldings, Doors—Glass—Gold Mosaics—Railway Coaches, Tramway Cars, Motor Cars, Waggons, Carriages—Ships and River Boats—Lead Pencils—Leather—Bookbinders' Cloth .. 57

CHAPTER IV.

METHODS : OIL AND JAPANNERS' GILDING.

Processes—Oil Gilding—Varnishing over Gold—Outlining—Shading—Glazing—Size Finish—Decoration on Gilded Surface—Limitations of Oil Gilding—Japanners' Gilding—Slow Drying Japanners' Gilding—Railway and Tramway Car Work—Transfers 74

CHAPTER V.

METHODS : GLASS GILDING.

Water Gilding—Preparing the Size—Preparing the Design—Preparing the Glass—Laying the Size—Laying the Leaf—Object Lesson—Prevention of Cloudy Appearance—Re-sizing—Prevention of Cissing—Polishing—Trimming—Faulting—Second Coating—Re-trimming—Fixing—Skewing—Outlining—Shading—Backgrounding—Fixing without Trimming—To trace the Design on back of Gold 87

CHAPTER VI.

METHODS : FRAME GILDING.

Object Lesson—Mouldings, Slips, etc., in the White—Bodying up—Clear Size—Prevention of Cracking and Chipping off—Stopping—Thick White—Smoothing and Trimming—Arrangement of Oil, Matt, and Burnish Work—Oil Gilding—Dabbing—Skewing—Faulting—Ormolu Size Finish—Matt Gilding—Second Coating—Burnish Gilding—Burnishing—To Wash Water Gilding—Compo Repairs—Carton Pierre—Papier Maché .. 107

CHAPTER VII.

METHODS : MISCELLANEOUS.

Clear Size Gilding—Gilding on Leather, on Paper, on Illuminated Manuscripts—Cardboard Mounts—Book Edges—Gold Blocking—Powder Gilding—Railway and Road Car Gilding—Deposit Gilding, etc. 124

CHAPTER VIII.

METHODS OF APPLYING THE LEAF.

Tip and Cushion Method—Handling the Tools—Manipulating the Gold—Blowing out the Leaf—Cutting up the Leaf—Carrying Leaf on the Tip—The use of the Double Tip—Prevention of Loss by Draughts—Transfer Gilding—Applying Transfers—Gilding from the Book—Hand Laying 131

CHAPTER IX.

RIBBON GILDING.

Gold—Aluminium—Imitation Gold 142

CHAPTER X.

BRONZING.

Powder Bronzing—Bronze Painting—Printers' Bronzing on Paper—Applying "Speckles"—Selection of Bronzes—Powder Bronzing—Bronze Painting—Antique Effects—To Bronze Iron Railings—Stencilling in Bronze—Bronzed Lettering—Aluminium Bronze 149

CHAPTER XI.

LACQUERING.

Lacquering Bronzed Plaster Casts—Scumbling and Wiping Out—Blue Lacquer—Broken Colour Effects—Re-lacquering 159

CHAPTER XII.

MEASURING AND ESTIMATING. 165

CHAPTER I.

MATERIALS.

METALS USED IN GILDING PROCESSES.—The following list embraces the principal metals and alloys of metal, available in the form of leaf or powder for the processes described herein. Their various peculiarities are described under separate headings and discussed as they occur in connection with operative work in subsequent chapters.

- PURE METALS
  - Precious
    - Gold (many colours and qualities).
    - Silver.
    - Platinum.
  - Common
    - Aluminium
    - Tin
    - Copper
    - Also known as white metal and silver substitute.
- ALLOYS
  - Dutch Metal (copper and zinc).
  - Schlag Metal (various).
  - Imitation Gold (copper and tin).
  - Ducat Leaf
  - Aluminium Gold
  - Gold Substitute
  - Copper and Aluminium.

(Prices quoted with descriptions following.)

BRONZE POWDERS.—An extensive variety of metallic compounds, colours, and texture, for various purposes. The following lists are averaged from several published by leading manufacturers.

Extra Superfine, known also as "monogram" bronze, of specially fine texture and high burnish, sold at 2/- per oz., or 32/- per lb.

Extra Fine, known also as "velvet," "superior," "superfine," and "perfect" bronze, a very fine powder of high quality sold at 9d. per oz., or from 8s. 6d. to 10/- per lb.

Fine, known also as "bright," "extra bright," "litho" bronze, etc., a good all round bronze for general decorative purposes. Sold at from 4/- to 6/- per lb., or 4d. to 6d. per oz.

Lower Grades of coarser kinds and commoner qualities, known as A, B, C and D qualities, or as Nos. 1, 2, 3 and 4, suitable for common and temporary purposes, sold at prices varying from 3/6, down to 1/3 per lb., or 3d. to 1½d. per oz.

Patent Bronzes.—A range of very fine powders, in a variety of stronger, more brilliant and assertive colourings than in the ordinary kinds. Prices from 3/- to 10/- per lb.

Colours.—All the above are made in a wide range of colours, chief of which are:—

> *Gold* (deep, medium, pale, rich deep, rich medium, rich pale), *citron*, *lemon*, *orange*, *copper*, *fire*, *crimson*, *green*, *dark green*, *olive green*, *moss green*, *steel green*, *blue*, *dark blue*, *mauve*, *violet*, *heliotrope*, *pink*, and *silver*.

Antique.—In addition to the above there is a specially fine quality made of semi-flat finish, known as "antique" bronze in a range of half dull but rich colours, embracing:—gold (deep medium and pale), orange, florentine, copper, tombac, autumn, drab, chocolate, pewter and oxidised silver. Sold at 1/- per oz., or 12/- per lb. This variety is most useful in figure bronzing and antique metal work.

Aluminium Powder.—A white metal which never tarnishes, is supplied in a similar variety of grades at prices ranging from 2/- to 10/- per lb., or from 4d. to 9d. per oz., according to fineness and burnish.

SPECKLES.—Under various names, such as speckles, "specks," "brocades," "spangles," "jewelling," "frosting," etc., metallic flakes, resembling very small fish scales, and used for decorating show cards, post cards, Christmas cards, artificial flowers, decorative backgrounds, lettering and other work where a glittering effect is desired, are issued in a range of colours similar to those enumerated above. These flakes are made by mechanical process in sizes varying from coarse (about the size of pin heads) to very fine, resembling a coarse powder.

Brocade speckles are cut from coloured leaf metals.

Metallic cut speckles are cut from very thin sheets of mica or celluloid, gilded and lacquered on one or both sides, with bright contrasting colours. The finer grades are known also as *Post card jewelling.*

Shell speckles are the same as the last named with each small flake made concave like a shell, for more sparkling effects.

White frosting for Christmas cards, etc., is of this series.

The prices of all alike range from 3/- to 8/- per lb. (3d. to 8d. per oz.) according to quality, fineness and burnish.

LEAF METALS.

Gold Leaf.—Foremost among materials used in gilding is the thin foil known as "gold leaf," made from pure gold with a very small quantity of alloy of either silver, copper or other approved metal, by the process known as "gold beating."

Gold Beating.—First the gold is made into small comparatively heavy plates, and these are rolled under great pressure, until they become long ribands as thin as paper, which are then cut up into squares of about one inch. Each of these squares is laid in the centre of a sheet of fine vellum, measuring about four inches square. These are laid one over another until they fill a "case" or double envelope of parchment made to contain 150 layers with about twenty loose leaves of vellum on the outsides. Next, with a heavy hammer, weighing about 16 lb., this case is steadily "beaten" for a considerable time, which spreads out the gold gradually until each square becomes nearly the size of the vellum leaves. These squares of gold are again sub-divided into one inch squares which are subjected to a similar process of hammering, the vellum being replaced this time by a thin animal membrane known as "gold beater's skin," and the hammer used being of less weight. Once more this process is repeated, the very thin leaves being again cut up into one inch squares and laid between similar membranes, but beaten out with a still lighter hammer, this time about 10 lb. weight, again spreading out the gold to nearly the extent of the sheets of membrane.

By this time each leaf is reduced to the extreme thinness of about $\frac{1}{300,000}$th of an inch, and about 2000 of them would be required to weigh one ounce. The next operation is to cut these into squares of 3¼ in. (or special sizes to order), and lay them into books each containing twenty-five leaves, the paper of which is first rubbed over with powdered bole to prevent the gold from sticking. It is then in the standard size and form in which gold leaf is supplied to the user, and the price of the best quality (which should not be less than 22 carat), extra deep or medium colours, is 50/- per 1000 leaves (40 books), or 1/3 per book, and decreases by stages for the paler colours, the lemon and white being sold at 37/6 per 1000 leaves.

SPECIAL QUALITIES and sizes of gold leaf are made for special purposes, one being a thicker leaf for use in the manufacture of *gold wire* (which is really silver wire heavily gilt) and of *gold mosaics*, also for iron railings, weather-cocks, vanes, etc., difficult of access, for greater permanence, and sold at 1/7, 1/9, and 2/3 per book, the latter being double the thickness of the ordinary quality. Another quality is known as *extra fine*, which is nearly pure gold, notable for richness of tone, and is sold at 1/4½ per book.

For *gilding on glass* selected leaf is put up in books free from the red bole powder already mentioned, in order to avoid possible discoloration. This should be ordered only as required, as the least dampness may ruin a whole book.

Absolutely *pure gold leaf* is seldom offered on account of difficulties connected with the beating process and its greatly increased cost, due to the disproportionately decreased quantity producible to the ounce—without corresponding advantage. Still, for special purposes it has sometimes to be employed, and can be obtained from the principal beaters to order. Price, 60/- per 1000 leaves (same size as ordinary quality).

Colours.—Distinct colours are peculiar to gold from different natural sources. These varieties used separately and blended together produce various colours of leaf, the list of which is further extended by admixture with other metals, such as silver and copper, very small quantities of which have considerable effect upon the colour of the product, until a range of colours varying from "red gold" to nearly white is issued for various purposes.

The stock colours best known are:—Red, orange, extra deep, medium (also known as "regular" and "ordinary"), deep, pale, citron, green, lemon and white. The latter approaches, by comparison, the whiteness of silver, but contains so exceedingly small a quantity of any metal but gold, that it has not the tarnishing tendency of silver leaf, so fatal to extensive use of the latter. The medium, deep, and pale are the three most popular colours.

Transferred Gold is the name applied to gold leaf after it's being pressed by a special process into close contact with white tissue paper so firmly that it securely adheres to the tissue, which it will leave only on being pressed upon a more adhesive surface such as the goldsize mordants explained in a later chapter. In this form the gold may be freely handled in the open air without danger of being blown away, though the leaf when not so secured is carried away by the most gentle wind.

Formerly the gilder, or his apprentice, had to prepare this himself by cutting up their empty books from which all the gold had been used and rubbing each paper leaf with beeswax on one side; this being laid over the gold leaf in a new book by gentle pressure secures the adhesion of the gold to the waxed surface. Such transfer was somewhat dangerous, because of occasional heavy, or uneven waxing causing too firm an adhesion of the gold to the paper, or the discoloration of gilded work by the wax and the powdered red bole which as already mentioned originally covered the paper.

The advent of "transferred" gold, upon clean white tissue paper without wax, as now supplied by the gold beater at the moderate additional charge of 2/- per 1000 leaves or one penny per book, was therefore welcomed from the outset, and has entirely displaced the waxing method of former days.

All other metal leaf may be obtained transferred in a similar manner, but as the only one in considerable demand is gold leaf, others may need to be ordered in advance of requirements.

Handling Gold Leaf.—Gold leaf is so quickly attracted and fixed by the least possible moisture that it must not be touched by the hands, when loose, or it will probably adhere and be totally spoiled. For the same reason gilders' knives and other instruments should be carefully kept dry, likewise all gold leaf that may be kept in stock, or there may be very considerable loss from spoiled leaf.

Ribbon Gold.—Gold leaf (likewise aluminium and imitation gold) is now supplied also in the form of a continuous "ribbon," mounted or transfer pressed upon a roll of thin paper forming one long "line" of gold of even width throughout, rolled upon a reel with a mechanical fixture to control the pressure and guide the application of the gold. This is known as Coe's gilding wheel, and is made in many widths to suit various classes of work. It is especially useful in trades where there are considerable quantities of lines, mouldings, chamfers, etc., plain or ornamental, to be gilded, such as railway, waggon, motor and tramcar building, house, church and signboard decoration. By this process the *handling* of the gold is reduced to a minimum, a distinct advantage, and an important saving of time is effected.

Foreign Gold Leaf.—Notwithstanding the high reputation of English gold leaf for superior qualities and reliable standards, there is much gold leaf made in other countries, some approaching if not quite equalling in quality, the English product. Generally speaking, however, these cannot be depended upon to maintain uniformity of quality and colour so well as that made by standard English gold beaters.

Inferior foreign gold is often beaten thinner in some parts than others, causing a shady appearance of the work when finished, and is not infrequently mixed with an excessive proportion of alloys, causing variation of colour from the richness characterising standard qualities of English gold. The one advantage in the foreign product is its lower price, as the best qualities obtainable are sold at from 10½d. to 1/1 per book. In the end the best quality is the cheapest and its finished appearance much superior to that of the commoner grades.

Powder Gold.—Gold is too ductile a metal to be pulverised in its normal state, still powdered gold is obtainable by a method described below, applicable also to silver, and is known by the distinctive name of *Powder Gold*, a term accepted by the gilding trades to mean pure gold, prepared from the best quality of gold leaf reduced to a powder in the following manner:—Using a pestle and mortar, grind a number of gold leaves with a little honey, into a stiff paste, then continue the grinding until it is apparent that the gold is pulverised to a very fine grade. Then add warm water and after stirring to dissolve the honey, allow the gold to settle to the bottom, and gently pour off the water. Repeat this a few times, and then allow the powder to dry upon filter paper, after which it may be put away in a phial and carefully reserved for future use in special work such as illuminated manuscript, intricate burnish gilding, etc. It is applied with weak gum water, as a paint, mixed as required. For burnishing it should be carefully noted that the gum water, made from gum arabic, be sufficiently *weak*, or the burnishing may be imperfect. (See chapter on "Methods.")

SHELL GOLD AND GOLD TABLETS.—The powder gold just described is sometimes made into a solid mass by the addition of clear weak gum water to form a stiff paste, and is then allowed to dry in a small mould, when it becomes a hard cake known as "gold tablet," or "illuminating gold," and is applied in the same manner as water colour paints. Or instead of drying in a mould it may be placed in the deep part of a shell such as a clean mussel shell and left there to dry, in which form it is perhaps the more economical in use, and is known as "shell gold."

If the production of powder gold and silver, and of their making up into tablets, etc., be regarded as too troublesome they may be obtained from leading gold beaters ready made at the following prices :—Powder gold, £7 10s. per oz., or 7/6 per dwt. ; tablets and shell gold from 3/6 each ; powder silver, 10/- per oz.

Platinum Leaf.—The use of this article is very limited on account of its high price and its dark grey colour in certain lights, otherwise it somewhat resembles silver but does not tarnish. Its chief value lies in its power of resisting extreme heat, and its use is confined to purposes which no other metal would accomplish, usually in connection with chemistry or electricity. Its current price in standard size as gold leaf is 2/9 per book.

Silver Leaf.—The leaves of all metals are made by a similar process to that described for producing gold leaf, but no other metal can be successfully beaten out nearly so thin as gold leaf, silver being the nearest approach is about three times the thickness. Therefore they may be *handled* more freely without special risk of damage or loss.

If silver leaf is kept in stock it is liable to become tarnished around the edges, by constant access of the air, and this renders the leaf unsuitable for most purposes even after cutting away the tarnished edges, work generally appearing " shady " where the leaves join. Books of this metal should therefore be kept in an air-tight case, under pressure, as that of a heavy paper weight.

The use of silver leaf is very limited on account of its rapidly tarnishing after application. It is therefore usually confined to glass decoration and other work where its surfaces may be protected from contact with the air, such as lacquered relief decorations and cheap picture frame mouldings. In this direction it finds considerable demand for the decoration of relief materials, such as Japanese leather wall hangings. Silver leaf is sold in books of fifty leaves, 4½ in. square, at from 10s. to 12s. per 1000 leaves.

ALUMINIUM LEAF.—This metal (sometimes described as white metal) closely resembles silver, but is entirely free from tendency to tarnishing. On this account it is largely used in place of the more precious metal, though its lustre is slightly inferior, and in colour it is somewhat greyer and colder. It is put up in books of twenty-five leaves, varying from 3⅜ in. to 6 in. square, at current prices of from 4s. 6d. to 8s. per 1000 leaves.

TIN LEAF (OR SILVER SUBSTITUTE).—As a good substitute in colour and softness of appearance perhaps nothing replaces silver so well as tin, and it has the same advantage as aluminium in the fact that it does not tarnish. But unfortunately it loses lustre soon after application, and it is far less tenacious than aluminium to the usual mordants, hence it is not a general favourite. It finds, however, a fair sale for the decoration of cheaper relief materials to give a brilliant effect to semi-transparent colourings applied over its surface. It is sold in same size as gold leaf at 5s. per 1000 leaves.

Aluminium, tin, Dutch, and other inferior metal leaves are usually supplied in sizes exactly corresponding with the size of book containing them, all being laid together in the rough and cut to size in quantities by guillotine, hence they are found more or less doubled up and untrimmed on the inside edge next to the binding. This is done for economy in manufacture, as the value of metal saved by accurate cutting of each leaf would not equal the cost involved.

Schlag Metal.—Sometimes the common metals are supplied without even the rough packing just described, being simply laid one leaf half way over another alternately, in the rough untrimmed state as they are taken from the beating process, wrapped in parcels of 100 leaves, and sold in boxes containing 10,000 leaves, at prices varying from 34s. to 44s. per box according to size and quality, the sizes varying from 5 in. to 5¾ in. square and the qualities usually in demand are the same as Dutch metal and gold imitation.

Gold Substitutes.—Of gold leaf imitations the number is legion, if we may be ruled by the number of varying names applied to these metals. Different producers and even dealers apply distinctive names to the same product for commercial purposes. The number of distinct materials, however, may for all practical purposes be taken as covered by the list described below.

Dutch Metal (or Bundle Metal).—The oldest substitute for gold leaf, and the best known is that known as Dutch metal, an alloy of copper and zinc, which tarnishes on exposure to the air if not covered by a protective lacquer. It carries a high lustre and is for this reason much favoured for metalled decoration of relief materials, subsequently to be finished with coloured lacquers.

IMITATION GOLD (OR GOLD IMITATION, COMPOSITION METAL, ABYSSINIAN GOLD).—An alloy of copper and tin produced under these names and others. Is of richer colour, softer appearance and generally superior quality to Dutch metal and does not tarnish so soon after application, though for permanent results it also requires a protective lacquer over its surface.

ALUMINIUM GOLD, GOLD SUBSTITUTE, DUCAT LEAF.—By these names and others, is known what is probably the best of all cheap alloys as a substitute for gold leaf. Its colour and malleability being in close resemblance to the precious metal, and its slowness to show oxidation rendering it more permanent in results than any of those already described. It is an alloy of copper and aluminium. For the most permanent results, however, like all copper alloys, it requires a coat of protective lacquer.

The prices of the three alloy metals last mentioned vary according to market prices of the crude metals they contain, also according to size of leaf and system of making up. The following quotations are a fairly accurate guide to the average prices current at time of publication.

Dutch Metal (sometimes called Bundle Metal) in books of 3½ in. to 4⅜ in. squares, packed in bundles of 2500 leaves—common 4s. 6d. to 5s. 9d. per bundle; best quality, 5s. 6d. to 7s. per bundle.

Imitation Gold, in books of 3⅜ to 6 in. square, from 5s. to 8s. 6d. per 1000 leaves.

Gold Substitute (*Ducat Leaf*), in books of 3⅜ in. to 4½ in. square, 10s. to 12s. 6d. per 1000 leaves.

Copper Leaf.—The peculiarities of copper are generally very well known. It need therefore only be said that copper leaf will behave exactly as other forms of copper behave under ordinary conditions, slowly oxidising to a deep rich red or brown, unless either lacquered or frequently polished. The former process effectually prevents copper leaf from changing colour if secured by a suitable mordant and lacquered soon after application, but frequent polishing would soon wear out the thin sheet of copper and may not be recommended. This leaf, however, might be more extensively adopted in the decoration of dining-rooms, restaurants, etc., with advantage on account of its rich colour and lustre and its permanence secured by lacquering. It is sold at 3d. per book or about 10s. per 1000 leaves, in the standard size of gold leaf.

BRONZE POWDERS.

Collectively under this heading are placed all those metallic powders and speckles already enumerated and described, whether of bronze, copper, silver, aluminium, or alloys of these and other metals, and although some dealers supply one or other of these under somewhat misleading names such as "gold leaf powder," these must in no case be confused with genuine "powder gold" made from gold leaf, as already described, as they invariably consist of one or other of the numerous substitutes, a list of which has already been given.

For limited requirements, bronze powders are supplied in 1 oz. packets of special non-adhesive paper, as they have a troublesome property of sticking tenaciously to all ordinary material. For this reason they should be carefully confined to their proper packages until applied to their ultimate destination.

Gold Paint, etc.—Under names such as "gold paint," "liquid gold," "silver paint," etc., a few good, some indifferent, and many very poor substitutes for gold and silver gilding materials are freely sold in the form of either a mixture of liquid medium and a bronze powder, or of these two materials, separately, to be mixed as required for immediate use. There is reasonable demand for the best of these, but the inferior kinds cannot be too strongly condemned.

While the quality of the bronze powder is very important, the quality of the liquid medium employed is of chief significance, as its office is not only to convey and to securely fix the metallic powder to a surface, but also and more particularly to encase every grain of the powder in a non-oxidising envelope of transparent lacquer, to prevent the subsequent exposure of the metal to the oxidising (tarnishing) influences of the atmosphere.

The commoner kinds soon lose all lustre and gradually blacken, while those of better quality maintain their lustre and colour for years.

The exact nature of liquid media employed in the best makes is kept secret by the various makers, as it is obviously a valuable commercial asset. The author has found the brands known as "Ardenbrite," "Glossana," "Ellamite," and "Oyama," the best of all that have come under his notice in a long experience, each having distinct media and all giving brilliant and durable results. There are doubtless others of equal merit, but before venturing far with an unknown article, it should be carefully tested on some unimportant material of inert kind such as a strip of glass, and exposed to oxidising influences for a few weeks (or months if needs be) to demonstrate its qualities.

TO MAKE BRONZE "PAINT."—A good "gold paint" may be made up in an emergency, by mixing a good bronze powder with hard spirit varnish, reduced with half its bulk of spirits of wine. This, if a fine quality of bronze is used, will be very permanent and suitable for many purposes.

Another medium less permanent, but still fairly durable, may be made from a mixture of quick drying japanners' gold size with half its bulk of shale naphtha. Turpentine spirit may take the place of the shale naphtha if necessary, but it is not so satisfactory, as it does not so completely evaporate. This may be used over oil paint without special danger if the oil paint is thoroughly dry and hard. Amyl acetate and alcohol form the basis of another good medium with the strong, familiar odour of a Jargonelle pear. Ready made medium known as "Gold Retainer," "Bronze Medium," "Bronzing Liquid," etc., are supplied by various makers, some bearing proprietary titles similar to the "gold paints" with which they are associated. The prices of these media vary from 8s. to 16s. per gallon.

MORDANTS.

Under the name of "mordants" are included all vehicles or media used as a binding coat, for attaching the metals firmly to the surface under treatment, whether in the nature of a water size, oil gold size, japanners' gold size, varnish or spirit preparation.

Old Oil Gold Size.—Foremost among these mordants must be placed that known as *Old* (*or Fat*) *Oil Gold Size*, which takes at least one day to dry into fit condition to take the gold, and according to atmospheric conditions, will retain its adhesiveness from two to seven days afterwards. This is made by allowing pure raw linseed oil to stand in an open jar for six or even twelve months, and carefully removing about every fourth week the thick skin which will form on the surface. This gradually deprives the oil of a large part of its drying components.

The quality of "tackiness" requisite for fixing the gold is thereby acquired. It can be decided only by experiment when the oil is in proper state to store away in a closed vessel as fit for its purpose. Before storing away add litharge one ounce to the pound, well ground in, and a small quantity of fine raw sienna, or Italian ochre (ground in oil) to give it suitable colour, stirring all well together and corking up securely. Keep in a cool place, but not where it may be frozen in severe weather. If it should seem too thick for proper spreading to an even, thin coat, add a little *boiled linseed oil, just prior to using*, but no more than absolutely necessary, and if the size does not harden sufficiently for gilding upon in twenty-four hours after application it may be rectified by the admixture of a little hard carriage varnish. Old oil gold size can be bought ready for use at from 2s. to 3s. per lb.

Japanners' Gold Size.—Next in order of importance is japanners' gold size, which is a product of similar nature to oil varnishes, but drying with special rapidity. It is made in various degrees of quick drying power, also of pale and dark colour and sold at from 8s. to 12s. per gallon. The dark variety is most favoured for gilding purposes. It is a transparent, varnish-like liquid ready for use, and may be coloured in the same way as described for oil gold size (in either case middle chrome may, if preferred, take the place of the raw sienna or ochre).

The advantage of this gold size lies in its quickness of drying, being ready for gilding in from ten minutes to about half an hour after its application. There are difficulties and some disadvantages inseparable from this gold size which must be noted. First, the tackiness necessary for fixing the leaf is not lasting and disappears entirely during the second hour after application. Second, the gloss or burnish on the face of the gilding is unequal to that resulting from the use of old oil gold size. Further, the durability of the gilding cannot be compared with the same workmanship upon old oil gold size. Modern demand for speed, however, renders japanners' gold size a most useful article, and if not gilded *too soon* (the commonest failing) its faults will not be very glaring. On the other hand, if left too long the gold may wash off when exposed to rain or cleaning process, or may even refuse to adhere at all.

By experience a gilder can gauge the right moment for applying the metal to this fickle mordant, ascertained by touching an insignificant corner with the back of his finger. When it is properly " ready " there will be a distinct " tack " upon the size, without its surface being in the least disturbed by a gentle pressure.

WRITING GOLD SIZE.—The two gold sizes above named are largely used for sign writing, but to suit various requirements of the trade most of the leading varnish makers supply a special sign writers' " gold size," which is virtually a " *slow drying* " *japanners' gold size*, at about 12s. per gallon, partaking of the qualities of both the above named to some extent, and drying in varying lengths of time, "*quick*" being ready for gilding in 2 to 4 hours; "*medium*" in 4 to 8 hours; "*slow*" 12 to 24 hours; "*extra slow*," 24 to 36 hours. These are the most suitable mordants for work that may have to be *stoved.*

WATER SIZES.

It has already been mentioned that moisture exerts a powerful attractive force over gold leaf. This force has been harnessed in the crafts of frame gilding, glass gilding and in other branches of decorative art by adding to water sufficient of a suitable mordant to cause the gold to adhere permanently after all the water has evaporated. The nature of this mordant differs with the varying requirements of the work in hand.

ISINGLASS SIZE.—The simplest of these water sizes is that used in glass gilding, and is merely a very weak solution of isinglass made in the following manner: Take two equal sized jars or jugs (perfectly clean), and into one jar place "a pinch" of the finest *Russian* isinglass shreads (about a small teaspoonful). Upon this pour one pint of *boiling* water, cover the vessel with a plate or saucer and leave in a warm place for about twenty minutes to dissolve; then stir and strain through cotton wool into the clean, dry vessel, and it is ready for use—to be used while very warm for best results. If a glass surface proves at all greasy after careful washing, a little pure spirits of wine (not more than two tablespoonfuls to the pint) may be added to the size to counteract the cissing. This should be added before straining through the cotton wool, as it also assists in clarifying the size. Some gilders invariably add the spirits for the latter purpose.

Matt Gold Size is a frame gilders' water size used only for smooth surfaces, and has the effect of producing a dead or matt surface on the finished gilding, more level and uniform than from the use of any other mordant.

To make this size, mix either gilders' clay, fine pipe clay, or Armenian bole, and finely scraped mutton suet (2 oz. to the lb.) to a stiff paste with water, assuring perfect fineness and freedom from grit by straining through fine muslin. Then reduce to the consistency of thick cream by adding hot parchment size (made by boiling parchment cuttings until a jelly is formed on cooling the water). A size made from the finest leaf gelatine will serve in the absence of parchment, and in either case the strength for use in this mordant should be such that if allowed to cool it would become a loose jelly about the consistency of table jelly. While hot and fit for use its consistency should be about equal to that of cream.

Five or six coats of this compound are usually applied, each being allowed to dry, and then smoothed over with finest glass paper before applying the next. After the final coat is dry the surface is well saturated with clean cold water (a little at a time) and the leaf applied while flowing wet (see "Methods").

Burnish Size.—Where it is desired that the gold shall be highly "burnished," a size is made similar to matt size but adding black lead (2 oz. to the lb.) into the first paste. The parchment size added just prior to use, as in matt size, must in this case be rather weaker or it will not "burnish" satisfactorily, its strength being reduced by adding one-fourth its bulk of hot water.

Matt size and burnish size ready for adding clear size, are supplied by gold beaters and dealers in oils and colours.

BURNISH SIZE.

Where it is desired that the gold shall be highly "burnished," a size is made, similar to matt size, but adding black lead in the first mixing, measured thus : pipe clay or bole, six parts ; black lead, two parts ; and powdered mutton suet, two parts ; to be ground thoroughly into the first paste. If the parchment or gelatine size finally added to thin this down is used too strong the burnishing will not be a success. It is advisable therefore to reduce the strength in this case by one-fourth its bulk of warm water. The mixture is applied in same manner as matt size and of the same consistency, likewise the gold leaf, which when just dry has to be burnished by gentle rubbing with a burnishing tool.

French Burnish and *Hein's Burnish Size* are varieties of special merit, differing from others in fineness, and in facile burnishing quality. Both may be burnished at any time after sizing. Hein's preparations are supplied by Messrs. Pavitt and Sons, London.

Gum Water.—As a medium for applying powder gold, weak solution of gum arabic is used, and for burnishing this needs to be very weak, indeed so weak that the gum water would not cause two sheets of paper to adhere.

Egg Size.—A good mordant for applying gold leaf and powder to paper and other absorbent material is made from the yolk of eggs and glycerine (equal parts) thinned with warm water. If this is used very weak the gold leaf may be burnished. It will act likewise for powder gold in place of gum water, if expedient. Stale or fresh eggs may be used.

Palmer's Jewelling Cement, Seccotine, Etc.—These mordants are used chiefly for ornamenting Christmas cards, show cards, etc., with bronze " speckles." They are of the nature of strong liquid glue, preserved from decomposition by means of oil of cloves, oil of peppermint, and the like.

Spirit Varnish proves a moderately tenacious mordant when allowed to dry, and the gold pressed firmly on to it by a heated die, as in the case of names impressed upon black lead pencils and the like. On any spirit varnished surface gold and other metal leaf will adhere by similar pressure and gentle heat, after the varnish has dried. As a liquid medium for making a bronze paint it is also very suitable (see "Making Bronze Paint"). Used in this way it becomes a very tenacious and a durable mordant.

Blocking Powders.—Of the same nature as the last named are the resinous powders known as "blocking" powders, chiefly used for what is called "gold blocking," meaning deep impression of patterns and lettering in metal leaf on such work as show cards, window tickets, leather goods, book bindings, and many other ornamental materials. This powder is sprinkled finely over the surface to be treated. The gold or other metal leaf is laid over that and the heated die is pressed down on both by means of a "die press." The heat of the die fuses the powder which at once attaches itself to both metal leaf and groundwork. The chief components of this powder are gum-resins, but the lowness of price renders any attempt to make it for ourselves unnecessary. It is supplied in three grades, ordinary brown, best brown, and white, at prices ranging from 2/- to 4/6 per lb., the latter for an extra strong and fine quality, and is obtainable from all leading gold beaters, bronze importers and dealers.

LACQUERS AND SUNDRIES.

Spirit Lacquers.—As already mentioned, all bronze powders and metallic leaf containing copper or silver must be covered with a non-oxidising lacquer to prevent tarnishing. This must be a spirit lacquer, or durable water size.

In addition to this necessity there is considerable demand for coloured lacquers for decorative purposes. Their colours are always transparent and the reflection from a gilded surface enriches that colour as no other means can. Thus the lacquer is made to fulfil a double purpose in the case of metalled gilding on various decorative surfaces, such as relief materials for wall hangings, friezes, etc., for which large quantities are used.

These lacquers should consist only of pure spirits of wine and shellac, coloured only with permanent dyes, though many of the cheaper kinds are made from methylated spirits, common resins and fugitive colourings. It is well, therefore, always to get the best qualities. The difference in cost will not be appreciable upon any but the most extensive work, as the spreading power of the lacquer is considerable.

To Make Lacquers.—If made at home the proportions should be generally about 10 oz. of shellac to one gallon of spirits, using white shellac for colourless and blue products, and orange or garnet shellac for warm coloured lacquers. For permanency of colouring, excepting blues (alkali blues), avoid alkaline or aniline dyes, using only natural dyestuffs of known quality such as gamboge, Turmeric root, and saffron for yellows and gold colours; dragon's blood for reds; aloes for browns; Brazil wood for crimson; fustic, logwood and others, and blend for varieties.

Prices.—Considering the trouble attendant upon their manufacture, it will generally be found more advantageous to purchase these goods prepared ready for use. The following is a list of regular qualities and colours, taken from the catalogues of various manufacturers whose products the author has found most reliable in use and for permanence of colour.

Best lacquers (in all colours, or clear), per gall., 36/- ; per pint, 4/6.

Medium lacquers (in all colours, or clear), per gall., 24/- ; per pint, 3/-.

Common lacquers (in chief colours, or clear), per gall., 12/- ; per pint, 1/8.

Florentine lacquers (in several shades), per gall., 24/- ; per pint, 3/-.

Xylonite lacquers (in all colours, or clear), per gall., 16/- ; per pint, 2/-. For cold drying and dipping,

Pavitts' Venetian lacquers (clear). For cold drying on silver leaf, per gall., 32/- ; per pint, 4/-.

Ducat Enamel lacquers, per gall., 24/- ; per pint, 3/-.

Aniline dyes used to colour common qualities of lacquers are very fugitive, and should only be used for temporary decorations.

ORMOLU.—This is the name given to a weak lacquer made from garnet lac or white stick lac, about one ounce, dissolved in a pint of spirits of wine, and coloured for deep gold with a little dragon's blood. It is used for improving the colour and uniformity of finish in best frame gilding and other fine work, and for this purpose is mixed in small quantities with weak jelly size made from either parchment cuttings, buffalo hide, or fine gelatine. The ormolu is supplied by gold beaters, etc., in deep gold, pale gold, and colourless varieties, at 2/- per pint, or 6d. per gill. For small quantities it is cheaper to buy these ready made than to make them.

Clear Size (Finish).—This is the finishing coat of clear size applied over gold leaf work as just described, but without the ormolu in cheap work. It is also used over silver and common metal gilding, before applying oil stains, oil lacquers, or oil varnishes, to intercept oxidisation which otherwise the super coat of oil would set up when drying by coming into direct contact with the metal. The clear size has no affinity for the oil, and so arrests its influence on the metal while the varnish or oil colour prevents immediate contact with the air. This method may be adopted in place of spirit lacquers in emergency with considerable success, though the latter are the most effectual.

These clear sizes are made as follows :—

Parchment Size, and Buffalo Hide Size.—These are practically of equal merit and are made by allowing the materials (about one pound in either case to the gallon of water), to boil continuously until the glutinous matter they contain is dissolved in the water to such extent that on cooling it becomes a solid jelly. The proper strength for use is the same as described for making matt gold size.

Gelatine Size is made by dissolving best thin leaf gelatine in boiling water (a half pound to the gallon), and gauging its strength in the manner already described for parchment size.

Glair.—This is a clear size used for many purposes connected with gilding, including that of a clear size finish.

It is made by whisking up the white of egg, and mixing with warm water in the proportion of the white of one egg to from four to six ounces (about one teacupful) of water.

N.B.—None of the clear sizes should be used if commencing to turn sour.

Whiting.—All whiting used in gilders' work must be of the specially screened and refined quality made for the purpose, free from grit and impurities, and must be rolled with a domestic rolling pin to a very fine powder and dried at a low heat.

Gilders' Clay is an extra fine quality of China clay specially prepared for use in frame gilding. It is obtainable from the gold beaters and from leading oil and colourmen, price 3d. per lb.

Water Scumbles come under the heading of lacquers on account of their position and decorative value being most closely allied to those of the lacquers. They are used to subdue and tone down the colours, to give rich antique effects to coloured lacquers over metals and are generally very simple compounds of water and dull browns, blues, greens, umbers, and siennas. For this purpose they are almost invariably added over lacquer decoration of relief materials to render the work less garish and assertive, at the same time enriching the effect. They are generally wiped off the prominent parts, leaving a dull subduing colour in all crevices and indented parts which adds richness and depth.

OIL LACQUERS.—These are compounds of boiled linseed oil, turpentine, gum resins and dyestuffs, made for similar purposes to those already described for spirit lacquers. As they dry by oxidisation instead of by evaporation, as in the case of spirit lacquers, they set up tarnishing of common metals, and can only be used over gold, aluminium or tin unless the metal is first protected either with spirit lacquer or clear size. Hence these are very little in demand. They are sold at from 16/- to 20/- per gallon.

In an emergency oil lacquers may be substituted by mixing pale boiled oil and copal varnish in equal parts and staining with tube colours in oil.

BLACK JAPAN.—This of fine quality is used, for fixing the gold permanently on the back of the work after gilding on glass. Its hardness and durability are increased by the addition of a little dry red lead just prior to using. It is sold at prices ranging from 16/- to 21/- per gallon.

SUNDRY MATERIALS.—In the preceding pages, sundry items are mentioned, the prices and sources of which may have been omitted. The following list will be found to embrace these, and it may be noted that all gilders' and bronzers' materials may be obtained from the chief gold beaters, lacquer makers, etc.

Gilders' Clay (for matt and burnish sizes), per lb., 3d.
Isinglass (finest Russian), per oz., 1/4.
Parchment Cuttings, per lb., 7d and 9d.
Buffalo Hide Punchings (for strong size), per lb., 7d.
Gelatine, per lb., 1/2 to 2/3.
Matt Size, and burnish Size, per lb., 6d. to 1/-
Hein's Matt Size, per lb., 1/6.
,, Burnish Size, per lb., 1/9.
(to which the jelly size of parchment or of gelatine must be added prior to use).
French burnish, 6d. per cone.

The current prices of other materials will be found in the text concerning them.

CHAPTER II.

TOOLS AND APPLIANCES.

In the matter of tools and appliances used by the gilder it will facilitate our purpose to consider them in the order of their use, commencing from the first necessities in dealing with the surfaces, and taking them in successive order down to the tools necessary for putting on the finishing touches of the work. List of prices will be found at the end of the chapter.

Pounce Bags.—These are small bags of coarse (washed) calico or linen containing whiting or French chalk, with which to dust the surface before gilding, if it happens to be tacky or doubtful as to hardness, in order that the surplus gold may in due course be "skewed" off without adhesion to the background. A pounce bag is made by laying upon a square piece of coarse calico or linen a handful of finely powdered and dried whiting or French chalk, then taking up the corners and edges of the cloth, and tying up tightly, forming a closed bag containing the whiting. As whiting has a tendency to cause oil gold size to spread, very little should be used.

Glair, already explained under the heading of lacquers (see chapter on "Materials"), is the best medium for counteracting tackiness, and unless used too strong gives no trouble. If, however, it is used too strong it may refuse to be removed by the washing off process after completion, especially if the ground was very tacky, and then a new trouble, in the form of "cracking" may be expected at a later date. The strength of glair best for this purpose is usually made with about a pint of warm water to the white of one egg (or half the strength already given for another purpose).

Brushes.—For applying the various mordants different brushes are necessary; first, for old oil size and japanners none can equal those made with *red sable* hair, for writing, lining or other freehand work. They have carrying capacity, spring, and smoothness combined with fineness of point and firmness which render them almost a *sine qua non* to the signwriter and decorator. Their price is higher than any other kind of brush, but to the practical man they are well worth all they cost. When these are finished with for the day (or even for an hour or two) they should always be washed clean with turps (of which the good workman keeps a small phial in his bag for the purpose) then should be greased with a little Russian tallow or lard and laid away straight until required again, when the grease must be removed by a fresh washing with turps before using again in gold size.

For filling in large letters, running in mouldings, beadings, etc., a *camel hair swan quill* pencil or mop of a larger size may be used, as these sizes in sable would be too expensive for minor purposes.

For laying in the gold size upon broad surfaces such as backgrounds, *flat camel hair* varnish brushes are used for smooth surfaces, and *flat hog hair* varnish brushes for rough surfaces. *Round hog hair* tools are used for enriched mouldings and carved work.

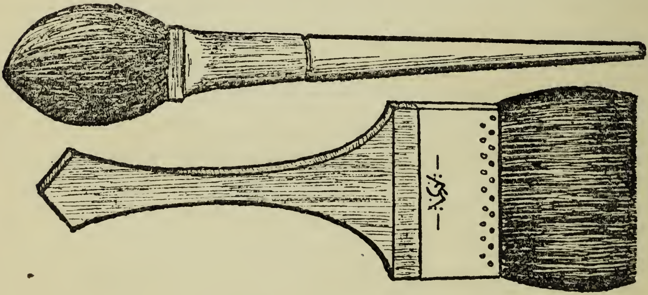


FIG. I. CAMEL HAIR BRUSHES.

For coach lining and similar work around panels, curved line work on ceilings, etc., the long haired pencils known as "*coach liners*," either of brown sable hair, camel hair or fitch hair are used, which, in common with the red sable "*writers*," already mentioned are supplied in various sizes distinguished by the kind of quill in which they are mounted, viz., lark, crow, duck, goose and swan. (See price list at the end of this chapter.)

For applying water sizes, *camel hair mops* are used on small work such as applying matt and burnish size in frame gilding, and *flat camel hair* "wash" brushes of 2½ in. width are used to apply isinglass size in glass gilding. Camel hair mops are also used for laying on media for bronze powders and lacquers for small parts, and flat camel hair varnish brushes for larger surfaces.

Bevelled lining fitches are used with a straight-edge for running lines on broad surfaces.

Round badger tools or *camel hair dabbers* are used for removing the surplus gold from around the edges of finished work. Cotton wool is used for the same purpose, either dry or damped, as occasion requires.

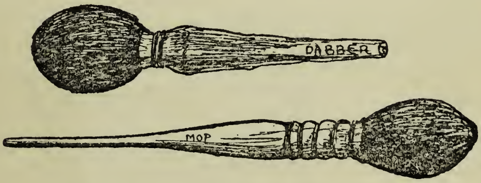


FIG. 2. DABBER AND MOP.

Cotton wool is largely used at all stages and in all branches of gilding. It should be only of the finest bleached quality, free from hard specks, such as found distributed in the commoner kinds which would scratch the finished gilding.

GILDERS' CUSHION, TIP, AND KNIFE.—These constitute the chief set of tools with which a gilder should be equipped, and their management is the chief difficulty the beginner has to master, first on account of the flimsy character of gold leaf, which is easily blown away by the most gentle wind, next because of the deftness that must be acquired in their use for holding, cutting, picking up and transferring the gold leaf from the cushion to the mordant that has been applied to secure it in its ultimate position. The use of the knife also calls for some practice to ensure accuracy and to avoid damaging the leaf. Hence he who would become a good gilder should early practise with these tools, using at first the best gold substitute, silver or aluminium leaves to acquire their necessary control, the correct movements and manipulation, to secure economy of time and material, before

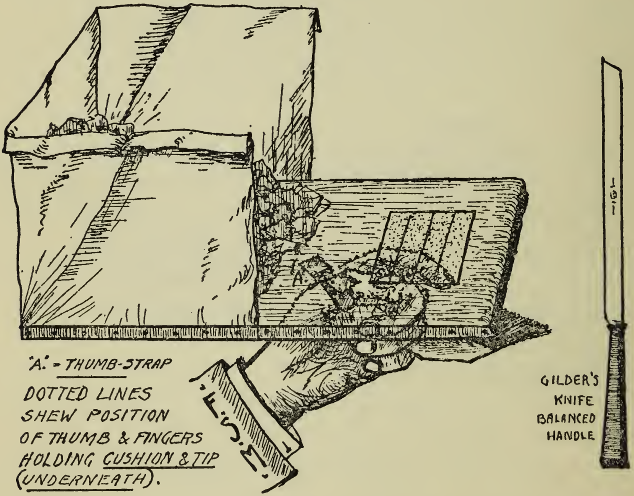

A
"A." = THUMB-STRAP
DOTTED LINES SHEW POSITION OF THUMB & FINGERS HOLDING CUSHION & TIP (UNDERNEATH).
F.S.M.
GILDER'S KNIFE BALANCED HANDLE

Fig. 3. Gilders' Cushion and Knife.

handling gold leaf, the waste of which in the training of a tyro involves a lamentable loss of the precious metal. As soon as the beginner has acquired the knack of handling these tools successfully with the commoner metals he should start to use gold leaf in order that their more careful management, and no less careful management of his own breathing indispensable to the manipulation of the more precious metal may be acquired.

The cushion is an oblong tablet of wood, about nine inches by six, covered with rough dressed calf skin leather padded with two or three layers of flannel cloth. At one end a screen of stout parchment is fitted (see Fig. 3) which, when out of use, is made to fold down flat against the top of the cushion. This, when erected for use, encloses several leaves of gold awaiting application, and protects them from occasional draughts. The screen may be made to stand erect by doubling over the top edge when, as sometimes occurs, the natural stiffness of the parchment is affected by the weather. Underneath the board forming the tablet of the cushion are straps forming loops, one in a suitable position for taking the thumb, which holds and controls the cushion when in use, and the other to hold the gilder's knife so that the whole set may be put away together for convenience when out of use.

The proper position in which to hold the cushion and tip when using will be understood from the accompanying sketch, the dotted lines on the top of the cushion indicating the position of the thumb and forefinger underneath, to control the tablet while manipulating and cutting up the leaf. An example of a leaf is shown laid in suitable position upon the cushion, cut into four strips, and the working stock (about the contents of a whole book of gold) is also shown loosely laid within the enclosure of the screen.

The "tip" is a thin brush of badger or camel's hair about 3 inches wide, the lengths of hair varying from ½ inch to 2½ inch or, by double mounting, up to four inches, according to the measurements of leaf they are to carry. They are made by cementing two pieces of thin cardboard together with the hairs evenly arranged between. The double tip (for laying full sized, uncut leaves) is made by fixing two of the larger sizes together and cutting out the centre of the card mount from one to allow full view of the whole leaf through the hairs. (See Fig. 4.)

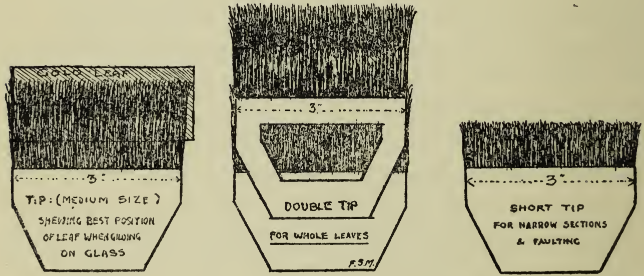


FIG. 4. GILDERS' TIPS.

The use of these thin brushes is to pick up the gold leaf and to carry it from the cushion into its permanent position on the mordant. When gilding small letters, fine tracery and long, narrow lines or beading, the ½ in. or ¾ in. tips will be found handiest, and will facilitate rapid and accurate work. When gilding large letters or broad surfaces the larger tips are required. It is therefore advisable to keep two or three sizes always at hand. The necessary carrying power is not a natural attribute of the hair of these tips, but is *imparted* during use by occasionally drawing the tip over the hair or beard which should be, in advance, *very slightly greased* for the purpose. Take special care not *to overdo the greasing* or the gold will cling so tenaciously to the tip that it cannot be transferred on to the mordant. This is a mistake that all beginners are sure to make a few times before learning to gauge their operations to the accurate nicety required for perfect work.

While laying out and cutting up the leaf with the gilder's knife, the tip is held between the third and fourth fingers of the left hand under the cushion (as shown in Fig. 3) that it may be deftly taken into use by the right hand immediately the gold is ready, to avoid possible disturbance of the leaf by draught, before its conveyance to the mordant. By the same movement the gilder's knife is placed in the position vacated by the tip, and held there until another leaf has to be dealt with, when these tools are again deftly transposed. This changing soon becomes, by constant practice, almost automatic.

Specially made " tips " have to be employed for *laying silver leaf* and the baser metals on account of their greater thickness, but the facility with which most of these may be handled without damage renders the use of a tip generally superfluous.

The *gilder's* "*knife*" is a very simple modification of an ordinary table knife, but is narrower, lighter, and has perfectly straight parallel edges from tip to socket. The cutting edge is not made as sharp as that of a table knife as it is quite unnecessary, and would cut the leather top of the cushion if too sharp. But it is very important that the cutting edge be perfectly free from notches, which would tear the gold, as will a spot of rust or dampness if allowed to form, therefore these knives must be kept clean and dry, and care should be taken that they do not get damaged on the cutting edge. For greater safety in this respect some knives are made with heavy handles in order that, if dropped, the blade will be uppermost and may escape injury. These are known as " balanced " handles, and are slightly higher in price than those of ordinary make.

The gilder's knife operates best by being placed down gently, but firmly, across the leaf, and with firm pressure drawn one inch towards the operator and then lifted adroitly from the leaf. On this point some gilders form a habit of drawing the knife until it clears the leaf entirely at every cut, and others adopt a saw-like motion, driving the knife an inch or so both backward and forward, to ensure a clean " cut." Practice, in this, however, must determine a gilder's habit, and the precise method matters little if the result is a sharp and clean division of the leaf into the desired number of parts, each quite free, that it may be separately carried away on the tip, without disturbing its neighbour.

SLING BOX FOR OUTSIDE GILDING.—When applying " transferred " gold leaf on work exposed to the weather, it is advisable to keep the transferred leaves (in quantity) enclosed in a small box with a hinged lid, and hung by a sling round the neck, in order that the operator may have both hands at liberty for the gilding process. An empty cigar box makes a good tray for this purpose, and it may also contain a ball of cotton wool for the final rubbing of the gilded work for a clean and brilliant finish.

SKEWING BAG.—A careful gilder will always have his " skewing bag " in his outfit. This is simply a three-cornered paper bag made on the principle of a conical sugar bag, about half a yard wide at the mouth, to catch and save all the surplus gold leaf which falls from the work when being cleansed of the overlapping bits of leaf, inseparable from " tip and cushion " gilding. The skewings have a regular market value. Gold beaters will buy them.

SPONGES AND WASHLEATHERS.—These should always be of the finest quality, as when it is necessary to wash down gilded surfaces to remove preparatory material from the groundwork, it is often impossible to avoid washing all over the gilded work at the same time, and good sponges or best chamois leathers well used will not damage the surface of the gold, sometimes even improving its uniformity of lustre, while rough quality of either would probably scratch the gold.

Burnishers.—For producing a highly burnished finish on gilded work, after using the special "burnish" size already described, it requires gently rubbing with a tool known as a "burnisher" (see illustration). This was originally simply a dog's tooth set in a convenient handle, and the same is still in use. But now most gilders use burnishers made from highly polished agate stones, which are cut into various shapes to suit different shaped surfaces. Burnishers also of polished steel are used, but are not so good for the purpose as the two first named.

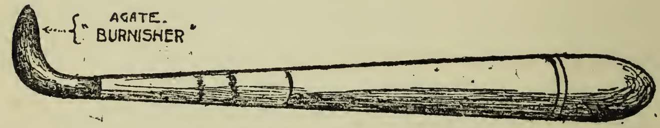


Fig. 5. Gilders' Burnisher.

Tools for Bronzing.—These comprise similar tools for applying the gold size, mordant, etc., as herein described for gilding. The bronze powders may be laid upon the mordant by any soft pad or brush. But the best tools for the purpose are, first, a pad of fine cotton wool rolled up to a firm ball; second, a small pad of velvet; next, the natural soft pad of a "hare's foot," or the camel hair dabber described above.

Tools for Lacquering.—Spirit lacquers should be applied with specially well set brushes made of soft, fine hog's hair or badger hair, and should be washed out with methylated spirit immediately when done with. *A stove* should be near by for warming the atmosphere while the lacquer is drying, or *a portable lamp* should be applicable to nearly come in contact with the work immediately following the brush which applies the lacquer.

PRICE LIST OF TOOLS.

Gilders' Cushions :

No. 1. 8 × 5½ in. (3½ in. screens)	..	1/3
No. 2. 9 × 6¼ ,, (3½ ,,)	..	1/9
No. 3. 8 × 5½ ,, (6 ,,)	..	1/6
No. 4. 9 × 6¼ ,, (6 ,,)	..	2/-
Gilders' Tips (assorted)	per doz.	2/6
,, (double)	,,	7/-
,, (silver)	,,	5/6
Gilders' Knives (balanced)	each	10d.
,, (ordinary)	,,	8d.
Burnishing Tools (agate)	,,	1/6
,, (flint)	,,	2/-
Camel Hair Mops, sizes ranging from	6d. to	5/-
,, Dabbers ,, ,,	3d. to	2/6

Note.—The most useful sizes are about 9d. to 1/6 each.

Hog Hair Round Tools (assorted sizes), per doz. 3/10.
Most useful sizes about 4d. to 6d. each.

Camel Hair Wash Brushes each 9d. to 2/-
Most useful sizes about 1/6 each.

RED SABLE WRITING PENCILS.

Large Swan	each	3/6
Mid ,,	,,	2/6
Small ,,	,,	2/-
Extra Goose	,,	1/3
Goose	,,	1/-
Duck	,,	6d.
Crow	,,	3d.
Lark	,,	3d.

BROWN SABLE LINERS.

Large Swan	each	3/-
Mid ,,	,,	2/3
Small ,,	,,	1/9
Extra Goose	,,	1/3
Goose	,,	1/-
Duck	,,	5d.
Crow	,,	3d.
Lark	,,	2d.
Short Camel Hair Pencils (assorted)	per doz.	1/6
Lacquering Brushes (extra thick), from 1 in. to 3 in.	each	1/3 to 4/-
Flat Varnish Brushes (½ in. thick), Hog Hair (from ½ in. to 3 in. wide)	each	6d. to 3/6
Most useful sizes, 1 in., 1½ in. and 2½ in.		
Palmer's Glass Jewelling Pencils	each	6d.

CHAPTER III.

PREPARATION OF SURFACES.

In order to secure the best results, the surfaces upon which gilders' work is to be executed should have special attention. Sometimes absolute smoothness must be secured before commencing the gilding process, at other times a rough groundwork adds to the artistic effect.

Painted surfaces require different treatment according as they may be of glossy or dead finish. Paper and leather require special preparation in order to receive gilding satisfactorily. Certain positions are unsuitable for gilding, from structural or æsthetic considerations, some may require specially beaten gold of heavy quality, while other surfaces may be more suitably decorated with gold substitutes both for decorative and economic reasons, and so on.

Painted Surfaces.—These should always be thoroughly dry and without tackiness before commencing to gild any ornament, lettering, etc., upon them, or the surplus metal will adhere to other parts than those intended.

Flatting paint which has a dead or matt surface gives no trouble of this kind even though it may only have been painted a few days. But paint with a glossy surface is prone to be tacky and must be carefully prepared as described under next heading.

VARNISHED PAINT.—A varnished surface has considerable advantages for gilding upon. But care should be taken that freedom from tackiness be secured, first by noting that each coat of paint be thinly applied and allowed to become thoroughly hard before applying the next, and then finishing with a carefully selected hard drying varnish. All this care and trouble will be repaid by the cleanness and brilliance of gilded work.

If after all precautions there is sufficient tackiness on the surface to constitute a danger in the adhesion of surplus gold, then the best preparation is a coat of weak "glair" all over the surface prior to applying the gold size, or in very mild cases a simple "pouncing" with powdered French chalk or whiting (see "pounce bags" and "glair" in next chapter). Either of these preparations should be sponged off with warm water where exposed after completion of the gilding. If left on too long, or the original surface exceptionally tacky, these preparations may permanently adhere and spoil the appearance. No rule can be laid down to escape this possibility which must be evaded, as experience alone will teach.

ENAMELLED WORK AND VARNISHED WOOD.—To both these surfaces the foregoing remarks equally apply.

PLASTER AND CEMENT SURFACES may be gilded upon with good effect if the parts to be gilded are first coated with hot jelly size. Many ornamental articles are composed of these materials, and decorations in fibrous plaster may thus be gilded for embellishment while quite new, adding to their decorative value during the long interval usually considered advisable between their construction and painting.

Parian or Keen's Cement, or old matured plaster work may be prepared for gilding upon by receiving one or two coats of knotting and then japanners' or old oil gold size.

Painted plaster should be treated as other painted surfaces, described above.

GESSO WORK.—This hand-made relief surface may be of a nature varying from simple plaster and size of porous texture, to heavily sized mixtures of plaster and starch, rice, etc., or may be a similar compound with the addition of coloured pigments such as the material known as Alabastine. Gilding on this class of ground is perhaps seen to special advantage on account of the various reflecting *surfaces* distributed all over the work, and its numerous shadows usually enriched by colour treatment, which supports and intensifies the effect of gilding. Gesso backgrounds upon signs and fascias for letters or ornament to be superimposed with the same or other material, or inscribed (as in graffito work) offer a variety of scope for decorative gilding. These may be prepared upon fixed fascias, preferably upon cement, plaster or stone, as the shrinkage of some woods causes gesso work to occasionally chip off *wood foundations.* Patterns suitable for gilding (as a background) can be made by combing a thick coating of gesso material such as Alabastine, with a grainers' steel comb, or by more or less irregular stippling of the wet ground with coarse cloth pads, or with the bottom of a tin canister gently pressed and quickly withdrawn, making a unique pattern resembling tree trunks and branches, each impression differing in detail from every other. For the last named effect, on a broader scale, a flat board having a handle behind will economise time and answer equally well. This may be of any convenient size or shape.

Such backgrounds when gilded, bronzed, or metalled, can be made to give superb effects by artistically applying coloured lacquers, subdued by water scumbling (described elsewhere), giving enhanced value to simple coloured ornament or plain lettering that may be raised upon it.

Before gilding gesso surfaces they should be tested for absorbency. Some material will be found sufficiently bound with size or glue in its composition so that the gold size may be applied direct, without preparation, while others will require a coat of strong glue size as described for plaster surfaces, or may be rendered non-absorbent by painted colour treatment along with the surrounding work.

Fixed gesso decorations such as ornamental panels of doors, spandrails, lunettes, friezes, etc., are specially enriched by all-over gilding in metal and decoration in coloured lacquers, with water scumbling, or by painted decoration with "jewelling" and tracery, in gold or coloured bronzes.

A ROUGHENED SURFACE of artistic and novel effect may be made upon a plain surface of wood, or other material, and one which makes an excellent gilding or bronzing surface, by laying the ground with a coat of strong size and covering this while sticky, with fine sago, tapioca, or small rice. This makes a good background for raised lettering or gesso ornamentation. The same method may be employed on cardboard picture mounts which will require a preliminary coat of weaker size.

RELIEF MATERIALS.—It is hardly necessary to remark that such materials as Anaglypta, Lincrusta and the many similar ready-made relief decorations are specially suitable surfaces for gilding upon, as they are everywhere so largely in evidence, gilded, lacquered, and scumbled in endless variety. Coloured bronze "speckles," spangled on backgrounds of relief materials, form a very effective treatment. The precautions and preparations given for gesso work in the last paragraph apply equally to these materials.

FAB-RI-KO-NA and other canvas surfaced decorative materials including coarse "scrim" (a stout brown paper with a coarse canvas face) are suitable for gilded and lacquered backgrounds for friezes, panels, sign boards, show cards, and any relief or stencilled ornament. Lacquering in broken colours on such grounds is specially effective.

Stone, Marble, and Granite in the shape of monuments, tablets, ornamental columns, capitals, etc., are sometimes gilded in parts, and if confined to such details as lettering, inscribed tracery, flutings, mouldings, capitals, and such parts as could be formed structurally of solid metal, then there is little to be said against this embellishment, though it is a debatable question whether or not the gilding of these materials is in the best of taste.

Iron and Other Metals.—On all kinds of metal work, gilding and bronzing are particularly appropriate, as metals may at all times and in all qualities be used in conjunction with each other. New ironwork need not be oil painted before gilding. If new iron can be gradually made hot, then dipped into or coated over with boiled linseed oil while warm, the life of the iron and the durability of the gilding is greatly increased, as the absorbed moisture generally present in cold iron is thereby driven out and kept out by the promptly applied coating of oil. The next best treatment as a preparation for gilding is to apply one coat of patent knotting on the bare iron (of which a second coat may be added in the case of very porous cast iron) before applying the gold size. This prevents the action of moisture from the iron affecting the gold, and in case of simple *bronzing* or metalling with any leaf except gold or aluminium it is a necessary precaution to prevent tarnishing. Other metals of finer texture than iron, such as copper, may be gilded with less fear in this respect, but when using bronzes or tarnishable metals the precaution is advisable.

Copper letters such as used for shop window and fascia announcements, stamped into V-shaped concaves are usually gilded and are known as "brilliant" letters.

If the metal is clean, these require no preparation before applying the gold size. Similar letters with convex fronts are seldom gilded, being applied to the front of their groundwork while the former are fixed at the back of the glass through which they are seen and by which they are protected.

Old ironwork that has been painted with oil paint may be successfully gilded with any metal if the old paint be removed and patent knotting be applied on the bare iron as a preparation. If the old paint is hard, one or two coats of a quick drying paint, made from pigments ground in turpentine and thinned with japanners' gold size may be applied as a preparatory ground, without removing the old paint.

If patent knotting be applied on oil paint it causes cracking which would disfigure the work in a few weeks.

Ironwork or steel that has to be enamelled by "stoving" is usually gilded prior to the last coat of stoving varnish. The groundwork having been already stoved will be hard enough and smooth enough to require no preparation. A special gold size is required for this work to stand the excessive heat of the subsequent stoving (see "Methods").

Radiators and other ironwork likely to become occasionally heated should not have any oil paint under the gold. A coat of quick drying paint thinned with japanners' gold size, and turpentine or wood naphtha, is the best preparation, and japanners' gold size only should be used for the gilding. For bronzing prepare with patent knotting. The gilding or bronzing should be done while the metal is cool. The lacquering should be done when the metal is hot.

Natural Wood as a direct ground for gilding upon is occasionally presented, as in oak fitments, furniture, tablets, church decoration, heraldic, civic and other insignia, incised signboard work, etc. The only preparation necessary before applying the gold size is a coat of ordinary glue size of medium strength, or of "glair" (the white of an egg beaten up in a teacupful of warm water). This may be applied either all over the surface (to be removed with warm water where exposed after the gilding is completed), and the gold size, which should be japanners' or old oil, is applied on this in any position desired, or, the preparatory size may be applied only to those parts where the gilding is to be done, in which case no subsequent washing off will be necessary; and in order that the gold size may be applied accurately over this preparation a little colouring matter distinct from the hue of the wood should be added to the preparatory size (any finely powdered pigment or other stain will answer this purpose). For very porous woods or when quick drying is of special importance, one or two coats of patent knotting may take the place of the preparatory size.

Distempered Surfaces in common with :—Cloth, Silk and Textile Fabrics may be gilded by adopting the "glair" sizing process described in last paragraph as a preliminary preparation for oil or japanners' goldsize, applied only where gold size is to be used. Tint if required with dry colouring matter.

French Polished Work requires no further preparation and is a very suitable ground for gilding upon. Either old oil or japanners' goldsize are suitable for the gilding process.

Paper, Parchment, Cardboard, Etc.—Picture mounts, illuminated manuscripts, show cards, window tickets, printers' work in gold and bronze, metal blocking for advertisement cards, book covers, and ornamental articles of papier maché, Christmas cards, etc., require papers of special kinds, heavily sized in the manufacture in order that the mordant used may not be rendered ineffective by absorption. Parchment contains naturally such a large quantity of size that it requires no preparation. Any paper may be made fit for gilding upon by first giving it a coat of clear parchment or gelatine size.

On cardboard *picture mounts* to be gilded all over, some of which are veneered with oak and other woods, a coat of thin patent knotting as a preparation, and afterwards gilding with oil gold size gives a good result, that may be washed, and for the process of matt gilding it is also a good foundation in emergency.

Thin paper is gilded all over and applied to various purposes, such as decoration of churches at festival times ; and being cut into strips is pasted on the bevelled edges of picture mounts, etc.

Other details are given under the heading of " Methods."

Picture Frames are usually finished by gilding, and have probably always been among the largest consumers of gold leaf.

When gilded directly upon carved wood, or on simple mouldings of natural wood, as in some of the plainer kinds of frame in popular favour, apply the preparation given for natural wood. This allows the natural grain of the wood to show in the gilding ; but if required to be gilded in the more finished style, known as " matt " and " burnish " work, then the preparatory size may be the same, but the whole surface must be further prepared with whiting and size known as " thick white," as described under separate heading in chapter on " frame gilding."

These remarks apply equally to mirror frames, chair frames, and other ornamental furniture.

Clearcole.—For matt and burnish work the first preparatory coat of size on the bare wood is improved by the addition of a little fine whiting, and is known thus as " thin white " or clearcole.

Compo.—The material now very largely replacing the old carved wood for ornamental frames, and known as gilders' composition, or " compo," is a putty-like compound of whiting, glue, resin, and linseed oil which, if well gauged in the relative proportions of its several ingredients, is an ideal material for its purpose. It is capable of accurate moulding into the most intricate ornaments, and of being smoothed either by dry or wet methods. It is strongly adhesive and so pliant that even after being allowed to harden it may be curved into any shape necessary to accommodate itself to mouldings, mitres, or ornament it is intended to enrich, simply by steaming the cast for a few minutes, and applying it to its position with an adhesive coating of strong glue. It may also be "wired" through in the casting to strengthen its application in the form of loose swags, or festoons, and of partly detached ornament as in Florentine frames, mirror frames, etc.

As a surface for gilding upon it requires no preliminary preparation and gives best results.

To make this material successfully requires considerable experience, as there is a knack in the blending that enables the practised hand to gauge each process to a nicety, and as in cooking, the finished result depends as much upon the operator as upon the quantities and qualities of materials used. Therefore if any difficulty is experienced in preparing this material to enrich a surface under treatment, it should be purchased either in bulk or in its finished ornamental form from the picture frame manufacturer or from a frame gilder, who is generally an expert in the matter.

This material should be cast in moulds made of plaster or hardwood for the purpose. The casting is done by first making the bulk pliable by a short immersion in warm water and while pliant pressing well down into the mould, which has been previously oiled to prevent the cast from sticking. Take out and lay aside to harden.

Some moulds are made of pliant materials such as the composition of which printers' inking rollers are made (treacle and glue), in order that sharp features and undercut casts may be assisted out of the mould, by dilation of the latter. Moulds made from gelatine are also used for similar purposes.

The compo can be made from the materials named in the following proportions (or *pro rata*)—Best French medal glue, 12 lb.; resin, 6 lb.; linseed oil, 2 qrts. Boil the glue until all dissolved in 1½ gallons of water, and stir well adding the (powdered) resin and oil, previously dissolved together by gentle heat, a little at a time until all dissolved, then add slowly, stirring all the while, sufficient well dried powdered and sifted whiting to constitute the whole into a homogeneous stiff paste. Use while moderately warm. Some gilders pour the liquid mixture of glue, resin and oil into a box containing an excess of powdered whiting, first stirring and then rolling and pounding the mass into a stiff dough with as much of the whiting as it will conveniently saturate for the purpose. Whichever method be adopted it is of the utmost importance that no *lumps* of whiting remain unsaturated or unmixed in the compound.

CARTON PIERRE is a material composed of whiting, paper or wood pulp and glue, of which ornamental mantels and other interior enrichment of structural detail is often composed. This has a very suitable surface for gilding upon, the gold or metal remaining unaffected from its composition even when laid directly on to its surface, using any kind of mordant that may suit the metal, and its smooth surface improves the lustre of the gold.

WIRE BLINDS.—These are not now so popular as formerly, but are still in occasional requirement for lettered screens to office windows. The parts to be gilded must first be prepared by "filling up" either with one of the popular "coach filling" compositions, or with a thick paint made from dry white lead mixed with equal parts of japanners' goldsize and turpentine to the consistency of thick cream, of which two or three coats will be necessary to fill up the texture to a level surface, upon which the old oil or japanners' goldsize is in due course to be directly applied.

CEILINGS, WALLS, MOULDINGS, DOORS, ETC.—Interior or exterior decoration of houses and buildings present many surfaces suitable for gilding, but the promiscuous application of metal should be avoided, as a meaningless display of gold or glittering metal is vulgar. There may be lavish display under reasonable conditions, but it should be so arranged that every inch of surface gilded could reasonably form the face of real metallic parts in the construction of the building, either as supports, as in columns and frames; astragals or layers, as in horizontal mouldings; slabs, as in solid panels, architraves and friezes; plugs, nails and inlays, as in rosettes, dots, lines and lettering; joists and trelliswork, as in structural mouldings on ceilings, and lines or other detail suggestive of strength and support in ornamental features. But the "etching" of ornamental enrichment, in gold or metal, such as the mere edges and tips of leaves, is a misuse of metal in a position quite indefensible from the standpoint of correct decoration or good judgment. Metalled backgrounds to panel decoration have been questioned in the same light but they are admissible, as panels of solid metal have frequently been applied in structural work—whether rightly or wrongly we will not stop to discuss in this treatise on the art of applying the metal.

GLASS presents an unrivalled surface for gilding upon, because if well done, the maximum brilliance of the metal is obtained, which is equal to that of the glass itself.

The process known as embossing and other variation of the surface of the glass by mechanical means are all enhanced by and enrich the effect of gilding on glass.

To prepare glass for gold or other metal decoration it is only necessary to secure an absolutely clean surface (see "Gilding on Glass.")

Ground Glass may be gilded with an artistic effect rather overlooked as a rule, adopting exactly the same process as just described.

GOLD MOSAICS are made of two layers of glass or one of earthenware and one of glass, with a double layer of gold hermetically annealed between. The process of making is beyond the scope of this book, as it involves a knowledge of glass manufacture, and the management of furnaces capable of applying the highest attainable degrees of heat. Similar remarks apply to gilding upon china and pottery.

RAILWAY COACHES, TRAMWAY CARS, MOTOR CARS, WAGGONS, CARRIAGES, ETC.—The manufactures of these vehicles are and always have been large consumers of gold leaf, broad and narrow lines, lettering, and interior decorations all displaying the gilder's craft. Mouldings and panels are purposely designed to give special effect to the work. Foregoing remarks applying to other *painted*, *varnished*, and *polished* surfaces apply equally to these, as they are constructed and finished with similar materials.

In preparing these surfaces, however, on account of the rough wear and tear to which they will be subjected, the gold is usually varnished over as a final protection, and to reduce the "dulling" effect of this supercoat a new method of ribbon gilding is sometimes adopted, the gold being applied directly on to the hard drying undercoat of varnish while "on the tack" in place of using a separate mordant. This produces a very highly burnished face upon the gold, counteracting to a large extent the subduing effect of the supercoat of varnish.

Ships and River Boats are extensively embellished by the use of gilding and are subject to the same comments on the preparation of surfaces, as just made with regard to railway and motor cars, etc., though it should be noted that the frequent necessity for external painting of sea-going craft, renders it advisable that where lines, etc., are intended to be gilded, they should be gouged out, presenting a concave surface for gilding, which will then outlast many paintings of the rest of the hull, and save waste of the precious metal while adding to the smart effect of the gilding.

Lead Pencils, Etc.—As already mentioned, the spirit varnish that is applied on lead pencils becomes a mordant when gently heated, and this renders such articles, including penholders, work-boxes and other polished wood articles, suitable for gilding upon by impressed die stamping. No preparation is requisite. The die of raised metal letters, ornaments, etc., being heated, softens the spirit varnish sufficiently to cause the leaf to adhere.

Leather.—This material is often gilded both all over (as in gilt leather for shoes, hat leathers, harness trappings, etc.), and with patterns, as borders around table coverings, shelf trimmings, bindings for upholstery, etc., as well as the impressed work in bookbinding. The leather must be cleaned, damped, well stretched and parchment sized before " all over " gilding, but for part gilding, as in bookbindings, hat leathers, shelf edge and other borders and trimmings, the leather should first be finished with a French spirit leather varnish, *i.e.*, a spirit varnish in which a small proportion of linseed oil has been compounded in the manufacture, and of which several are made for the purpose, under the name of leather varnishes. The gilding is described elsewhere.

Bookbinder's Cloth.—Cloth made to imitate leather is now much more used than real leather for book covers. This is heavily sized in its manufacture and requires no preparation. The gilding usually " blocked " or impressed with hot dies is described under separate heading (see " Gold Blocking ").

Book Edges for best work are gilded with burnish goldsize, of which three or four coats must be given, and the gilding and burnishing effected as described for the same process in connection with " frame gilding." The edges of the leaves are sometimes first coloured with a bright red, blue, brown, or other wash colour. This gives the edges of the finished book the pleasant appearance of " shot silk," gold varying with the colour employed. Marbled and embossed patterns are sometimes added prior to the gilding for decorative effects.

CHAPTER IV.

METHODS (OIL AND JAPANNERS' GILDING).

The methods by which gold leaf, and other leaf metals are made to assume a position of close permanent contact with various surfaces, will be most conveniently studied by taking them in sections, under separate headings, as follows :—

(1) Processes.—Oil gilding, japanners' gilding, water gilding (including glass gilding, matt and burnish gilding, clear size gilding, etc.), and gold blocking.

(2) Methods of Application.—Cushion gilding, transfer gilding, gilding from the book, ribbon gilding, hand metalling.

PROCESSES.

Oil Gilding may be considered the leading process with which we have to deal. It consists of two divisions, first the application of old oil goldsize as a mordant, and the application of gold leaf to its "tacky" or sticky surface when dry, before hardening. The nature and properties of old oil goldsize have already been minutely described (see Chapter I). All surfaces to receive oil goldsize must be non-absorbent, or the size would "strike" out beyond the limits desired ; it would also soak into the material and lose the tack by which the gold should be secured. The groundwork when not to be gilded all over however prepared should be entirely free from tackiness. So important is this condition that many gilders never take any risk, but give every glossy painted or varnished surface a coat of weak glair or a light " pounce " of whiting before commencing to apply the goldsize (see Chapter II). The precaution is a very wise one. Even the most experienced gilder cannot always be sure of the total absence of adhesiveness in a varnished or oil painted ground until under actual test. To apply a small bit of gold leaf on an out-of-the-way corner and then try to wash it off as a trial in advance may result in a favourable verdict for the hardness and non-adhesive character of the surface, and then, after all, when gilding has been completed it may transpire that some of the surplus gold will adhere. This is due to a subtle adhesiveness which operates only upon a slight increase of temperature or pressure set up by the friction of the cotton wool in polishing and cleaning up the work prior to washing off.

It is, therefore, always advisable to pounce or to " egg size " (glair) the groundwork, wherever there may be a chance of this occurring.

Some gilders always work upon a flat or dead ground coat in painted work, any varnishing that may be required being put on between the lettering or outlines of gilded ornament after the gilding is completed. This considerably simplifies the gilder's work and removes difficulties. But the gold never looks so bright and the ground cannot possibly be so well varnished by this method as by completing the varnishing first, and gilding afterwards upon the varnished surface. Therefore the latter course is recommended, and the difficulties should be surmounted instead of being shirked. This can be done quite successfully if the directions given here and in Chapter III. be closely followed. The glair or powdered whiting used should be easily removed by washing with a sponge and lukewarm water after completing the gilding, finishing with a damp chamois leather.

However small a portion of the surface has to be gilded, the whole of the groundwork must be covered with the glair preparation, or the surface where it has been used may present a different appearance from its surroundings after washing off. Allow the glair to dry before the next process.

The surface being ready for gilding trace out carefully with pipeclay, soft chalk or crayons as faintly as may be practicable the design intended to be put in gold. For lettering and straight lines in this *setting out* a chalk line (a fine cord of soft cotton texture rubbed with chalk) should be used, and all straight lines may be "struck" with this rather than sketched by hand. This prevents any alterations leaving marks upon the background, for such marks have an obstinate knack of becoming fixtures just where least to be tolerated.

Another method of even greater cleanliness, is to sketch the design first upon "lining" paper and then "trace" it exactly on the surface to be gilded.

The *old oil gold size* must be tested for drying and length of time holding the tack. Also if found rather stiff or viscid in use, may be thinned with a little boiled linseed oil, not turpentine. It should be of such consistency that it flows easily from the point of the pencil on to the work, and may be spread out to a thin film with a high gloss.

In gold size of good quality every furrow left by the brush in application should entirely disappear in a few seconds leaving a surface like that of the finest oil varnishes, and *if not too freely applied*, should not, upon a vertical ground, "run" down in waves, wrinkles or tears while drying.

It should dry overnight fit for gilding, retain an adhesive tack for at least three days, and afterwards become quite hard with a lustrous surface.

To apply this gold size use a red sable "writer," "liner" or "swan quill," or a camel hair mop, hog hair or other fine haired varnish brush, according to the character and breadth of work under treatment. For lettering, lining and ornamental tracery the former are much the best, and of these a considerable variety is made to suit every kind of work. For plain mouldings and for "filling in" large letters that have been first outlined with the red sable, use either a swan quill, sable, or camel hair mop, according to breadth required; and for broader surfaces such as plain backgrounds, flat varnish brushes of finest quality should be used, while for enriched mouldings such as in picture frame gilding a round hog hair tool is the best, both for even distribution of the goldsize and the absence of angular mounts to the bristles which would be liable to damage the compo relief ornaments among which it has to work.

See that there are no " fat edges " left on any part of the work before laying away the brushes on completion of the gold sizing process, as these would not become dry throughout, and may rub up in the final polishing, causing annoyance and trouble to rectify. All goldsize should be applied as thinly and evenly as possible for best results.

While goldsize is drying there should be no dust allowed to settle upon it, if avoidable, as that partly destroys its mordant qualities and spoils the appearance of the gold when finished. Indoor workshops where gilding is being done should therefore be sprinkled with moist sawdust before sweeping, when required.

Note.—When old oil goldsize is ready for gilding it may be described as dry but not hard. It has been described by some writers as " nearly dry," " partly dry," and " surface dry," when the proper stage is reached for applying the gold, but all these are incorrect descriptions, for it is well known that once the air is prevented from contact with linseed oil, as in the case of enclosing the latter within a metal envelope, all further drying of that oil ceases, and were the goldsize *not dry* when the gold is applied, it never would dry hard, and together with the gold would easily rub off on being cleaned at any future time, a sequence which most gilders have at one time or another actually experienced. Linseed oil has three stages clearly marked in its drying process, all well known to regular users and distinguished as *setting*, *drying*, and *hardening* stages. Between the two last named it is said to be " on the tack." The value of gold size lies in the lengthened suspension of the last of these three stages, during which it carries a " tack " upon its surface while quite dried throughout its texture. When thus ready, if the gilder holds the back of his finger against the size with a gentle sideways pressure he does not in the least disturb its surface or substance, though he finds an adhesiveness holding his finger, with a tenacity called the " tack," and which firmly holds the gold or other metal leaf laid upon it. The hardening process goes on independently of any further atmospheric contact when the drying stage has fairly passed. Upon this latter feature the value of this mordant rests.

Having successfully arrived at this stage the size must be covered with the gold leaf before the hardening stage sets in, and the quality of the goldsize in this respect should be well known beforehand in order to avoid possible loss of time and trouble by too long a delay. Every separate making of this size will differ in this particular, but may be tempered as described under the heading of " mordants."

The application of the gold leaf may now be carried out by one or other of the methods described later in another chapter, either by cushion, transfer or direct gilding, according to circumstances and selection, therein mentioned. But whatever method of conveying the leaf to the mordant be adopted the following details must always be observed and processes be carried out. First, each leaf or portion as it is applied must overlap its neighbour about one-eighth of an inch in order to secure a faultless joint. Each of these joints must be separately and very carefully dabbed down with the cotton wool pad or camel hair dabber as soon as convenient, moving the dabber in the direction which will most perfectly close down the joint. All outside limits must also be slightly overlapped with gold leaf for similar reasons, and as early after application as convenient all the gold should be firmly and systematically pressed down by the same means into close contact with the mordant using uniform pressure which will put an even surface upon the gilded work, and being continued a little longer with a circular movement while holding the skewing bag below to catch the surplus gold leaf loosened in the process, puts a final burnish upon the gold. This process is known as *polishing*.

Prior to the rubbing necessary to the latter process it is well to look carefully over the whole work for any faults in the gilding, such as cracks or holes in the leaf, or gaps in the joints which may have escaped attention, and would probably, if rubbed over in the polishing process, be covered with dust and so deprived of the tack necessary for their proper completion.

VARNISHING OVER GOLD.—When really advisable this should be done with special care and forethought. For most work the process is entirely superfluous and serves no advantageous purpose, but rather the reverse so far as the gold is concerned. It is, however, of considerable advantage in such cases as the exterior gilding of railway coaches, tramway cars, etc., where the usage of the work demands its frequent cleaning with scrub brushes, and other rough appliances, which would entirely destroy the thin foil of gold, were it unprotected. In such cases, varnishing is resorted to, and if properly provided for does not greatly detract from the brilliance of the metal. In the first place the gold is laid either upon a slow drying and glossy goldsize *when near to its hardening stage*, or is laid only in the exact shape and position required (*as by ribbon gold and transfer work*) directly on to a varnished ground during its tacky transition stage between the drying and hardening stages. The latter of these methods involves considerable dexterity and experience for good results. Either gives the gold a high gloss unattainable by other means, but of somewhat unstable tenure, unless varnished. The varnish then has the double advantage of protection and of entirely counteracting an undesirable black appearance of such highly burnished gold, noticeable in certain lights. Varnishes are made of almost colourless transparency by the principal varnish makers specially adapted to this kind of work and are known as railway and tram car body varnishes, white oil and white marble varnishes, etc.

OUTLINING.—Gilded parts such as ornamental designs and lettering, when upon dark coloured backgrounds may, generally with advantage, be left unsupported by anything in the way of embellishment, as the contrasting dark ground will give full value to the work in all aspects. Not so upon light backgrounds, or with light coloured ornament imposed upon gold background, in which case an outline or other similarly placed support of a colour contrasting with both leading features will enhance the decorative value of the gilding beyond the extra cost involved.

SHADING of interlaced gold tracery, or strap-work, often adds much to the richness of decorative effect, as in heraldic blazonry, interlacing lines, letters, etc. This is effected by painting over the gold with vandyke brown and burnt sienna, both separately and combined, either in water colour (size bound) or in oil colour. The former when to be varnished over, the latter when not varnished, to be applied with precision, only to parts where it must remain, as it would in either case leave a stain if wiped off again.

Oil gilding work may sometimes present a lack of *uniformity* of colour due to alterations in the compound of the goldsize during the progress of the work, gilding at different periods of the tacky stage, or from slightly differing shades of gold used. Slight variations may be remedied by a coat of glair (size finish) for indoor work, to which a little ormolu may be added to enrich the colour if desired. Both these materials are described in Chapter I.

The special requirements of oil gilding on enriched relief work such as in picture frame mouldings, etc., are described under the separate heading of "Frame Gilding."

Oil painted or milk bound distemper decoration may safely be applied over backgrounds gilded by this process, prior to which in either case a coat of clear size lacquer is advisable to facilitate the work.

Oil gilding is not suitable for applying tarnishable metal such as silver leaf, Dutch metal and other gold substitutes, but may be used for laying pure aluminium leaf and tin leaf, with favourable results.

If tarnishable metal is applied over oil goldsize, the oxidation of the latter already accomplished sets up the tarnishing process in the metal. The proper mordant for these metals is a quick drying japanners' goldsize in which oxidation is minimised by process of manufacture.

Oil gold size should not be thinned with turps. When necessary to reduce its consistency boiled oil alone should be used or it may be made workable by standing the vessel containing it in a larger vessel containing hot water.

JAPANNERS' GILDING.—For this process the same preparation of surface as described for oil gilding, is necessary. In the more expeditious method of gilding known by this name, the gold size is of a different character to the old oil goldsize dealt with in the last item, though containing linseed oil, the tacky stage lasting but a few minutes, and altogether disappearing during the second hour after application. In this difference lies one advantage of japanners' goldsize, which dries in from ten to thirty minutes and remains " on the tack " generally for about the same length of time. The quick drying of this goldsize enables a gilder to effect a small job from start to finish at one visit, and also to finish as he goes along with outside work when changeable weather or other conditions render this course desirable.

From a commercial standpoint these are advantages. But as already named, the lustre and smooth surface of the gilded work cannot be made equal to that of oil gilding, first because the gold size sets too quickly for the easy laying of an even film upon the work, and dries too soon for the flowing out of brush marks to procure the level surface which oil goldsize naturally assumes while drying. The early loss of adhesive quality causes considerable trouble if neglected, the work having to be re-sized or the gold adhering so slightly that it will easily wash off, to the ultimate discredit of the gilder. On the other hand if, in his anxiety to avoid the annoyances just named, the gilder applies the gold too soon before the goldsize has positively turned the drying point, the gold will have quite a dullness in place of lustre, and the gold size will never thoroughly dry for want of direct contact with the air. In the latter event the polishing process may work up the soft gold size as any rubbing will likewise do at a future time.

If, however, with a knowledge of these drawbacks, a gilder carefully guards against them by dexterous application and accurate gauging of time allowed for drying, good work of a lasting character may be done, securing on gold leaf a brilliance which gives satisfaction for many purposes.

In applying the gold or other leaf upon japanners' goldsize, any of the methods described later may be adopted, but it must be noted that a pad of cotton wool or dabber be kept at hand for frequent use to bring every part of the leaf into close contact with the mordant before the tack goes off. It will be necessary to do this every few minutes or the result from the rapid hardening of the size where not in contact, may be a mottled appearance of the gold, and perhaps its failure to adhere in some parts, which may cause the whole work to require re-gilding.

The gold successfully applied requires the same polishing and in every other way the same treatment in the finishing as described for oil gilding. It may likewise be glaired, shaded, outlined, or painted upon for similar purposes to those named in the same connection.

Japanners' goldsize is the best mordant for tarnishable metal, such as silver leaf, Dutch metal and gold substitutes, because during its manufacture the oxidising of the oil contained has largely been accomplished and rendered inert by other necessary ingredients added to the compound, and like varnishes of which it partakes in nature depends for its qualities upon the maker's skill more than upon its exact composition.

It generally contains besides linseed oil and gum animi, a large quantity of turpentine, and drying agents such as litharge, red lead and copperas. To give the process of making here would be of no practical value as the gilder could not be supposed to have facilities involving a large plant with considerable danger to the maker. It should therefore be obtained from one or other of the many well known makers of high class varnishes.

Some makers temper this size as to drying power so as to meet many varying requirements, such as in metal laying or sign writing, where a gilder may wish to complete two hours' gold sizing and then proceed right away with the gilding to economise time and to avoid defective work. An advantage of these varieties is the fact that they usually hold their tack for about the same length of time as elapses between application and drying point. For convenience these are arranged in four standard degrees and distinguished from the ordinary gold size by a separate name, one well known firm calling them "writing gold size"; another "special gilding size"; and the standard grades are—quick, 2 hours drying; medium, 4 hours; slow, 12 hours; and extra slow, 24 hours.

The slower the drying the easier the gilding; but also the greater the risk of tarnishing of metal leaf or bronzes, that may be applied by their agency.

CHAPTER V.

GLASS GILDING.

WATER gilding embraces all those processes in which the mordant is some adhesive material dissolved in or mixed with water as a vehicle, in place of using linseed oil or one of its products.

These we will take in order of instructive value, commencing with the most simple.

GLASS GILDING.—It must be said at the outset that to gild on glass on its front side or face as though dealing with an opaque background is inexcusable bad taste. There is occasionally seen an example of this kind in small towns and in seaside holiday resorts. The beauty and simplicity of the more correct method involve little more expense of labour and material, and very little practice by a gilder who can do the one will enable him to do the other with far greater credit.

Isinglass size is used as the mordant, and the reader is referred to Chapter I. for the way of making this size (make fresh size daily as required). Other mordants have been used, notably similar weak solutions of gelatine, parchment size, gum tragacanth, gum arabic, or white of egg ; dilute whisky and gin have also been used with some measure of success. But none of these are so free from faults as a simple weak solution of isinglass, and for greasy surfaces to this is added a small quantity of pure spirits of wine.

If the isinglass obtainable is not of sufficiently fine quality to make a perfectly clear solution, the spirits (added prior to straining through cotton wool) will clarify the size. The spirit assists the rapid drying of the gilding and at the option of the gilder may or may not be always added to his size. Personally the author has found it possible to dispense with the spirits and with the finest Russian isinglass to execute even solid gold backgrounds and large lettering on glass that exhibit no flaw, some of which, executed over twenty years ago, is still in evidence at the time of writing, apparently no worse for the lapse of time.

Common qualities of isinglass have a yellowish tint and cause a cloudy appearance over the gold.

Assuming now that we have a large glass sign to gild with the object of its adorning the fascia of an important business establishment, and that letters are to be of gold, outlined with brown with a background of deep cream colour, we have a framework upon which a good description of processes can be submitted.

First clean the glass thoroughly, finishing with a handful of tissue paper. If, however, as in cases of old plate glass, there appears to be a greasiness hard to remove, clean down with a weak solution of nitric acid and afterwards with clean water.

Prepare the full sized design of the lettering and border line with ornamental corners which surrounds the lettering, upon a sheet of thin white lining paper. This must be accurately traced over with Brunswick black, which will be distinctly visible on the reverse side, which when dry is fixed against the front side of the glass as a guide for the laying of the gold. The design is kept in close contact with the glass by a dab of paste being applied at short intervals on the margin.

While on this subject, it may be mentioned that there are other methods equally efficacious for applying the design to the glass, direct sketching of the design upon the glass with a piece of French chalk is sometimes a preferable method. Another method is to whitewash the window and to sketch the design upon this with a chisel ended stick. The last named method is not recommended because the whitewashed surface when seen transparently during gilding, is so streaky and cloudy that it interferes with the judgment of the gilder in the cleanliness of his work.

In the work before us now we prefer the paper, because at a later stage we remove it from front to back to trace the design upon the back of the gold, as described later.

Lay the glass upon a level bench, face downwards, and tilt it up at the back a few inches until the glass forms an angle of about fifteen degrees with the bench, so that the size, when applied, will flow gently down the inclined surface.

Tip and cushion gilding is the only way of successfully laying the gold in glass gilding. Make these ready, putting out all the leaves from one book or as many as may be convenient to the operators, according to practice, on to the screened part of the cushion, while the size is " brewing." When the latter is made ready and strained (see instructions in Chapter I.) bring into use while warm. Apply this size freely with a flat camel hair wash brush, one of about 2½ in. breadth is a convenient size, proceeding in the following manner.

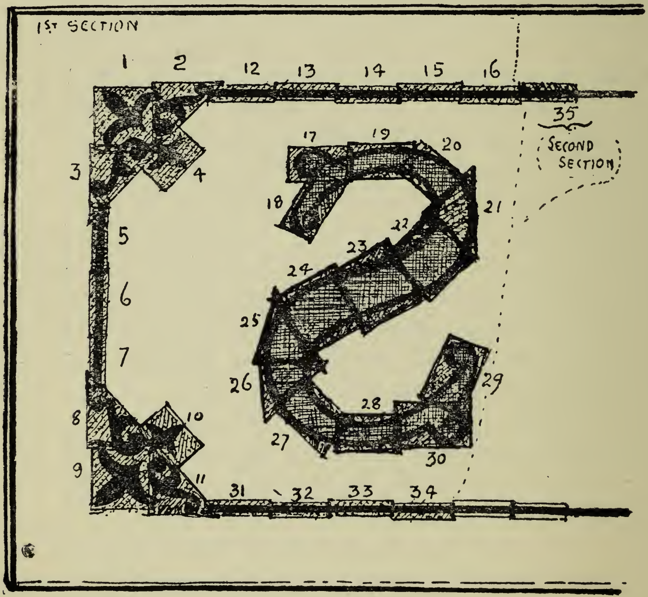


FIG. 6. GILDING ON GLASS.

Commence at the top left hand corner and lay on the size as a wash all down the glass and about 12 in. to the right. Go over this once with a moderately filled brush and then a second time with a more abundant supply floated on at the top to run down the lower space without bubbles of air or other impediment. Lay down the brush across the top of the size vessel and having already the cushion, tip the knife in position on the left hand, take the knife in the right and placing, as explained under separate heading, the first leaf into position on the pad of the cushion, cut it if required, and convey the first piece with the tip to the size while still flowing wet. The first piece must be placed over that part of the ornamental cornerpiece nearest to the top left hand corner of the glass. (In our object lesson, this, it will be noticed, is a whole leaf placed with the "double tip" over the extreme angle of the corner ornament—see illustration.) The size will exercise a special attractive force bringing the leaf suddenly from the tip on to its own surface when within about $\frac{1}{4}$ in. of the glass. Hence the tip must be so held when outside that limit that the gold may be brought within that influence exactly at the right place. It must at the same time be *held parallel with the plane of the glass* in order that the leaf may assume a perfectly level surface upon the glass, stretching out immediately to its fullest extent. The latter point is very important, because if one edge is nearer than another that edge will come under the attractive force sooner than its opposite, causing the leaf to be drawn in a huddled up or folded condition on to the size, and its probable destruction as a necessity rather than spoil the work. It may be noted here that if such an accident should occur it will always pay best to take the erring leaf completely off the glass with the wash brush point rather than try to patch up to it with fresh leaves.

It may be taken as a truism that "cutting-up wastes most gold," and for curved lines or ornamental work it is better to use whole leaves, half leaves, or other "one-cut" sections as far as possible rather than, by further dividing and sub-dividing the leaf into narrow strips to apply short lengths, in order more nearly to confine the gold to the limits of the design. Observation will convince the gilder that, when overlapping of joints, wastage at the curves, and the extra time occupied are all counted up, the saving will be in favour of applying a half leaf or even a whole leaf where at first it would appear to be the reverse. In addition to this economic side of the question there is the more important one of results; and though gold specially selected and packed for glass gilding (see Chapter I.) may be used there is always the danger of a slight difference of shade being noticeable at the joints. Therefore the result obtained with the smallest number of joints is always likely to be the best.

On reference to the illustration (Fig. 6) in which the leaves or sections of leaves are numbered in the order of their application, it will be noted that the gilding is effected in sections, from top to bottom of the glass, working downwards to follow the natural flow of the water size, each section being not more than two or three "leaves" wide. This is a special point of the greatest importance, because, were gilding to be continued horizontally the whole length of the plate, in sections of transverse position, the "runs" of size from the upper sections across the lower would dry before being approached for the gilding of the lower sections, leaving upon the *glass a thin film of hard size*, probably invisible to the gilder, but which would certainly, if not removed, cause a shady or cloudy appearance on the face of gold subsequently fixed upon a *further coating* of size. This is one of the most frequent causes of "cloudy" work in glass gilding, and has led some gilders to work with their glass laid horizontally to prevent the running and rapid drying of the size—which can then be applied more freely, and the gilding effected before the drying of any part.

There is a danger of too thick a coat of the size remaining between the gold and the glass when dry by this method, detracting from the mirror-like brightness of the finished work which it is always the gilder's aim to achieve. On large sheets of glass such as shop windows where it is impossible to work successfully without the "runs" drying upon the lower parts, the gilder should have at hand a second wash brush and a vessel containing hot water, with which to thoroughly soak off the dried film of size before re-damping with fresh size for gilding. This is not difficult, for though invisible these runs are easily discernible by the gelatinous "pull" felt under the damping brush, which should be systematically rubbed over the affected surface until it is evident that the dried film is all removed.

The former wash brush is then again brought into use with the warm size and the gilding proceeds as before. Each time a lower section of the glass comes under gilding operation after a short interval, this washing off process should be carefully repeated.

In the example we have set out to accomplish, there is no need to leave the lower section of glass exposed to this danger, and working across the whole depth of the glass in short sections reaching from top to bottom all we have to do to avoid similar trouble is to watch our size, and by frequent application of fresh size, see that no part is allowed to dry. Then as a precaution " work up " the jointing with the fresh size at every " shift." If the size is kept warm by the vessel containing it being stood in a pan containing hot water, frequently changed, this maintains the clearness of the size necessary to the accomplishment of clear gilding. The pan of hot water serves for the washing-off process just described, and for occasional washing of the sizing brush.

In the illustration of our example the sections may be distinguished by the number attached to each leaf or portion shown *in situ*, the figures representing the order in which the gilding should proceed. The second shift displays some relative details, small in themselves, but important to perfect working. The principal of these is that the top work of each shift should be carried a little further into the next shift than the corresponding extreme at the bottom. This is to avoid the running size carrying away the lower gilding when commencing to gild the next shift, by getting under recently laid leaf below. It is worthy of note that the last named property of the size, often proves useful to the gilder, when by some oversight the size may have been allowed to run so thin on the glass as to fail to spread out the leaf to a perfectly smooth surface (which should occur immediately), then by promptly touching the glass immediately above the leaf with the brush charged with size, the size will pass under the leaf and spread out in all directions, causing the leaf to stretch quite flat unless there be a " dry " spot, which would, under these circumstances, refuse to budge, in which case remove the leaf, cleanse, and re-gild the part.

On laying the first leaf into position (No. 1 in Fig. 6) it may happen that the flowing size will carry the leaf downwards, but that only proves that the gilder is in good time with this process. It may be raised again into its proper position by placing the point of the " tip " against it, and after holding it thus for a few seconds it may be left and will remain stationary. Take particular care to avoid touching the wet size on the glass with the hair of the tip, which would cause trouble explained later.

Then the second leaf is applied to the right of the first, and will be found to remain stationary. Each leaf as in all other gilding should slightly overlap its neighbour. The first two leaves being now applied at top limit of the section, the next two are placed immediately below in same manner

Then follow with cut up leaf sections applied to cover the upright line forming the end, as shown in sketch.

Before applying the whole leaves forming the lower cornerpiece, it will be advisable to flow more of the warm size on the part, taking the full brush nearly up to, but not quite touching the last leaf laid, and before laying the brush down size over the second portion, taking the full brush into close proximity with gold already laid and blending the size with that left from the sizing of first portion. Apply the leaves to the prepared second portion of first section, then commencing with the top line, as numbered 35 in Fig. 6, proceed with second section, observing the same system and precautions as above described, then the next, and so on by sections to the other end of the sign.

It must be carefully noted that the hairs of the tip should never touch the size upon the glass. If this occurs two sources of trouble may be set up. First the size on the glass may " ciss " on account of the small touch of grease transferred from the tip, and next the tip, becoming wet with the size, would hold gold leaf so tenaciously that the gold would have to be destroyed to be removed.

In order to avoid these annoyances take up each piece of gold leaf upon the tip in the manner illustrated (Fig. 4) leaving a narrow margin of the leaf beyond the end of the hairs to protect the latter from accidental contact with the size.

In gilding the letters (curved and foliated in our example for the sake of instruction) follow the maxim laid down at the outset—"cutting up wastes most gold"—completing with as few leaf joints as possible. A careful study of the illustrations in this chapter will considerably assist the student in following the plans I have suggested.

In glass gilding, like all other systems, the gold leaf applied should be slightly larger than the portion of work it has to cover.

The example in hand being now fully covered with its first coat of gold leaf, the gilder must await the thorough drying, which leaves the gold in closest contact with the glass, bound only with the thinnest imaginable film of isinglass.

POLISHING.—Before either faulting or second coating, the first coat must be cleared of loose gold from all the overlapped joints and brought up to a burnish-like brilliance by gentle rubbing, using a soft pad of finest cotton wool with a circular motion for the purpose. This process is called *polishing*, and must be done with a *very slight pressure* or the gilding may be scratched. The work will now have a considerable burnish-like gloss which is improved by the whole being *flooded* with very hot water, not boiling, as that might break the glass. This may be done with a camel hair wash brush. The water should be so quickly and lightly applied that the hairs of the brush do not scratch the gold, and do not go over any of the gold twice. The object in this is to again liquefy the size between the gold and the glass, in order to secure its perfect uniformity. This must be allowed to dry, then the work is ready for its next attention, the nature of which depends upon the *trimming* process to be applied.

Trimming.—There are two methods of trimming the gold to its exact shape before finally fixing and backgrounding. First there is the "chisel trimmer" process, done with a lancewood "trimmer" shaped like a small chisel, which the gilder uses to mark out the outlines by removing the gold with the moistened chisel point, leaving clear edges and sharp corners around the gold in its permanent design, at the same time clearing a narrow space of bare glass outside these edges, essential to the next part of the process. The trimming just described is done after the first coating of gold has been polished and flooded when dry, and before either faulting or second coating, chiefly because the design upon the paper on front side of the glass can be distinctly seen through one coat of gold and the trimming thereby guided into shape without difficulty. All designs and lettering being "reversed" on the working side of the glass this distinct advantage should not be overlooked.

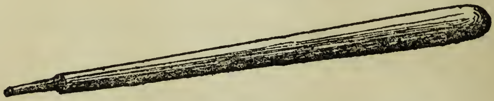


Fig. 7. Gilder's Trimmer.

The trimmer will require occasional sharpening as the wood wears soft with constant use and frequent moistening. It is used freehand, with the aid of a mahl-stick (used in signwriting to steady the hand upon while working), and for straight lines with a straight-edge to guide the trimmer. The straight-edge should have a small pad of cork glued under each end in order to raise it about ¼ inch away from the gilded surface, which it would otherwise probably scratch.

Glass gilders keep several straight-edges of varying lengths, fitted with cork pads, to suit the various spaces with which they may have to deal. By these all their straight lines, long or short, such as the outlines of block and other plain letters, top and bottom edges of most letters, straight border lines, etc., can easily be negotiated by the chisel trimmer without damage to the surrounding work.

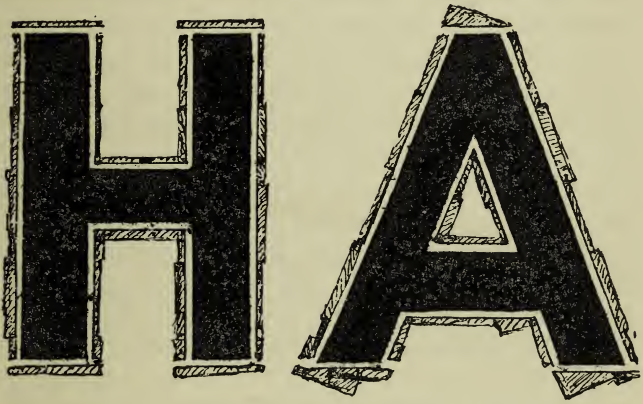


FIG. 8. ILLUSTRATING "TRIMMING."

The use of the chisel trimmer requires a little practice, but to one who can do the sign writing or tracery in ordinary painted work this is merely a matter of a little extra care after the first trials.

For the benefit of the beginner it may be noted that the trimming chisel is generally a home-made instrument cut from a stick of lancewood, which may be had from the nearest coach builder for the asking (they use the wood for carriage shafts), otherwise from a common cedar wood penholder or from a meat skewer used by butchers cut to the shape shown in Fig. 7. This is frequently moistened with the lips or by dipping into warm water, in order that the gold upon the glass may be more easily removed with just such pressure as found necessary to scrape off the gold and make a narrow line of clear glass around every line, letter, and ornament that is designed to remain on the glass. The weaker the size used the easier the trimming will be. Do not attempt to trim straight lines without the use of the straight-edge unless very sure of your freehand ability to do so correctly.

The trimming of ornamental letters (such as in Fig. 6) would be mostly freehand, as fancy tipped Gothic letters have very few, if any, straight lines introduced.

When the trimming is finished, then commences either the second coating or the faulting. This is a much easier process than the first coating. There is no necessity to flood the whole glass with size as in the first process, but to work in sections after the manner described for first coating facilitates progress.

FAULTING.—In cheap, or temporary work, however, the second coat is sometimes omitted and then a process called "*faulting*" is necessary. This is simply laying on patches to cover any cracks, holes or very thin parts visible in the first coating which it is thought would affect the finished work. Sometimes these patches are so numerous that second coating all over would have been more economical. The patches also occasionally show very brightly to the disadvantage of the surrounding one coat work when all is finished.

SECOND COATING (OR DOUBLE GILDING).—For the best quality of work, a *second coating* of gold leaf should be applied over the first before any *fixing* paint be laid on (explained below). The second coating entirely counteracts the semi-transparency of the leaf and its greenish colour, which affects the first coating, also possible shadiness of appearance due to same causes, and adds a uniform solidity of finish quite unattainable with one coat only.

Fresh isinglass size should be made for the second coating and this need only be applied lightly, exactly over the parts to be gilded. Do not rub or use any pressure with the wash brush in applying the size or the first coating of gold will be damaged. Take the damping brush from the warm size and pass it *only once* over the part to be gilded, and damp about enough for one or at most two leaves at a time, without allowing the size to "flow" down the glass as in first coat, as that would now soften the size under the first coating of gold, causing it easy damage when damping the parts a little later for the second coating. A "flowing" coat is not a necessity at this stage, and the risk of such damage need not be incurred.

The second coating generally uses rather less gold leaf, as it is now much easier to confine the gilding within the limits of the design, and cutting the leaves rather more economically than before, the desired object can be achieved with less wastage beyond the outlines, though overlapping of joints must be repeated as before. When this is thoroughly dry, re-polishing and re-trimming must follow. The re-trimming will simply be a repairing of the first trimming at the parts now seen to be overlapped with gold of the second coating (or faulting). The trimmed out margin of clear glass around the designs should be about one-eighth of an inch broad, and free from specks of gold, which would become fastened by the next process, called "fixing."

FIXING is done by applying a coat of varnish (or japanners' goldsize) over the edges of the trimmed work all round, covering the gold about one-eighth of an inch and the clear glass about one-sixteenth beyond the gold outlines. When this is dry, paint over the body of the work (*i.e.*, within the outlines of letters, lines, ornaments, etc.), with black japan, in which a little red lead has been mixed, covering every part that has to remain, and leaving no parts exposed excepting what has to be entirely cleaned off. The black japan should be applied close to the edges of the gold but not overlapping on to the glass, thus giving the immediate outline the double protection of the varnish and the japan. Turpentine should not be used as it weakens the fixing properties.

When the fixing coat is dry, surplus gold may be cleaned off where now left, by coating with warm water and rubbing with a pad of damp cotton wool. These pads should be taken care of, and sold to the gold beater, who will extract the gold to be used again. Finish with cold water and a chamois leather as in ordinary window cleaning, and the work so far as gilding is concerned, will be complete and durable.

Should it be desired to leave the gilding with the clear glass all round, nothing more need be done, and an occasional fresh coat of varnish around the edges if the usage of the work shows the first varnishing to be giving way will from time to time renew the life of the gilding.

Where the work has to be outlined, shaded or covered with a painted ground, these follow the processes already described, in the order named. All paints used should be mixed with varnish and, for the background only, a little turps may be added. Tube colours are best.

Direct Fixing.—The next best method to the chisel trimming process consists in the application of the "fixing" medium of black japan and red lead direct upon the second coating of gold, without the use of the chisel trimmer at all, forming the letters, lines, or ornaments (reversed, of course) with a sable pencil, of suitable size, and when this is dry, using the soft pad of cotton wool with warm water to soak and wash off the surplus gold, afterwards fastening down the edges with a coat of varnish in the same manner as described after chisel trimming, then painting the outlines, shade, and background, observing the same restrictions as named already.

This process of trimming the gold into definite shape is recommended for intricate ornament, or lettering with very ornamental outlines, also for small lettering crowded into limited spaces.

THE DESIGN is *traced* upon the gold after completing the second coating or faulting, by carefully removing the paper copy from the front of the glass, and making a *pounce* of it, by laying the paper upon a thick cloth and pricking the outlines of the design with a needle at intervals of about one-quarter of an inch or so, according to the size of the design, then fixing this by small pieces of gummed paper upon the gilded side to correspond exactly with *guide marks* made for the purpose upon the front of the glass (and the paper likewise) before removing, and next *pouncing* the design through the pricked holes with red chalk or lamp black contained in a pounce bag, made as directed in Chapter II.

EMERGENCY PROCESS.—It may be here mentioned that there is a method of gilding in cases where outlining, etc., has to be done, which the author's experience has proved defective, but which has the advantage of speed and cheapness, and is effected by first applying all the painted work that has to be done, leaving clear glass where gilding is required. This is then gilded after the manner already described, the gold slightly overlapping the painted outlines. This is second coated or faulted, and fixed as already explained, and the work is complete without the chiselling process. But the whole gilding process is rendered difficult to effect free from shades, cracks and blemishes, with a highly burnished finish, by the presence of the paint. Hence this method is only adopted in emergency by the gilder whose desire is to display the best workmanship, and to achieve best results.

PLAIN GOLD BACKGROUNDS on glass are probably the *bête noir* of most gilders. But when proficiency in "tip and cushion" gilding has been acquired, the application of whole leaves will be rather enjoyed than avoided, and by thorough cleanliness, first of the glass, next of the size, and lastly and chiefly of the *modus operandi* above described, carefully avoiding the chance of two coats of the size in odd places remaining between the gold and the glass, by constantly washing and re-sizing, a perfectly gilded surface, showing no shades or joints may be secured. In this it is imperative that a perfect system of working in neat square sections shall be followed and that above all *special gold leaf* made and packed for the purpose shall be used (see comments on gold leaf—Chapter I.). Lettering and other decoration to be applied may either be cut out by the chisel trimmer and painted in afterwards or may be painted first upon the glass and gilded over when dry.

Glass Gilding Peeling Off.—The frequency of the gilding " flaking " off glass signs and shop windows is due to want of ventilation ; the one failing of glass as an ideal surface for gilding, is its total lack of " key," and if the gold becomes damp occasionally from accumulated moisture, the mordant, which is a water size, becomes weakened thereby until it eventually loses its power to bind the gold and glass together. The next change of temperature will then cause the trouble named. To avoid this it should be seen to that free ventilation, *i.e.*, outlets for vapour above, and for condensed moisture below, are properly provided in the frames or casements enclosing gilded glass when fixed.

In framed signs for fascias and the like the backboard fitted to secure the back from damage may, with great advantage, be so made that a free escape for moisture that will collect whatever precautions are taken can be secured. An effective method practised by the author is to have the backboard made a half inch less in depth than the opening it has to fit, and then fix this so as to allow quarter of an inch free opening at both top and bottom. Work framed in this way by the author has successfully stood the test of over twenty years' exposure, outside, in one of the most variable climates of the world.

CHAPTER VI.

FRAME GILDING.

THE most intricate processes of gilding, involving most work, care, and knowledge are those applied to picture frame gilding, the gilding of chair frames, mirror frames, etc.

There are three methods by which this branch of gilding is regularly effected, viz., OIL GILDING, MATT GILDING, and BURNISH GILDING. The former of these is identical with oil gilding already described, as to its mordant and the application of the leaf. But the usual preliminary preparation of the surface and the special "finishes" applied require special study and practice to ensure the superior results associated with this important branch.

To take these methods in most useful order let us imagine that we have a new frame "in the wood" (meaning just as constructed with the mouldings of bare wood), with an inch "slip" (the flat inner frame generally surrounding good work), which fits easily into the rebate of chief moulding, and has a small hollowed bevel in the edge next to the picture. The frame moulding surrounding this may be assumed to consist of a variety of members comprising flats, beading, fillets, bevels, ogees, hollows and rounded mould with enriched ogee (leaf work), leading member compo corner pieces, and a deep plain cove facing the outside of the frame (see the sketch section illustrated in Fig. 9).

These mouldings and slips are usuallysupplied by manufacturers to the gilders in long lengths, *in the white* ready for applying goldsize whether matt, burnish or oil, after a safety coat of clear size.

Formerly the gilder had all to do from the bare wood upwards; and now in case of repairs or matchings as well as for specially designed frames and furniture work he has to execute all the preliminary preparations known as "bodying up," and "compo" ornamenting. This done, the work is then described as "in the white," a condition rapidly acquired by mechanical compression by the wholesale manufacturer in turning out large quantities, often better in quality and greatly cheaper than could be done by hand.

BODYING UP.—The smooth surface known as "*bodying up*," is produced as follows (commencing with the bare wood). The "slip" is detached and similarly but separately treated.

CLEARCOLING.—The bare wood is first coated with mixture of *strong parchment size* and a little whiting, *applied hot*. This is known as "*Clearcole*," or "*thin white*." Any other glutinous size may be used, though parchment size, buffalo hide size, and gelatine are best. One or other of these must be used for subsequent work, and uniformity of this material prevents future trouble. Only one coat of clearcole must be given, and it must be applied very hot in order that it may thoroughly penetrate the pores of the wood.

Clear Size.—The size used in all work after the clearcole must be especially pure and of elastic character such as parchment size, gelatine sizes and buffalo-hide size. Whichever of these be adopted at the outset, the same should be continued through every subsequent process, *maintaining a uniform strength.* The correct strength is that known as *weak jelly* strength, *i.e.*, such as would assume, on cooling, the consistence of *weak* table jelly. The strength and uniformity are both very important and should be determined in advance by careful experiment, and proportions noted for accuracy without loss of time in future mixings. Some gilders learn to test the strength of *hot* size to a nicety by frequently pressing a drop of the liquid between the finger and thumb—if it gradually becomes *just sticky* without strong adhesiveness they approve of its strength, but the beginner must not expect to be competent to do this with accuracy until he has become used to the work.

If the strength of size varies to any appreciable extent between one coat and another of the processes explained below, then *cracking and chipping off* may be looked for at a future time when the frame is hung in a warm room. Of all these sizes that known as parchment size finds most favour.

The clear size is always used hot, and the frequency of its use in this work renders it advisable to keep a pot of the right strength quite warm upon the hob or standing in an outer vessel of hot water always ready.

Stopping.—The next process is the filling up of any holes, cracks or faulty joints in the wood. This is done with a putty made of fine whiting, and the hot clear size. When dry this must be levelled and smoothed by rubbing down with fine glass paper.

Thick White.—After removing all dust apply three or four coats of "*thick white,*" made from same ingredients (hot clear size and fine whiting), mixed to the consistency of thick cream, each coat to be applied thinly and quickly while the mixture is hot, then allowed to become quite dry and rubbed smooth with fine glass paper before the next coat is applied. When the last coat is dry, and smoothed with finest grade of glass paper, pass over the chief parts with a wet pad of soft calico a few times to make the smoothness more perfect, taking care not to remove the whitening from any edges or other parts by unnecessary pressure. A small pointed stick may be wrapped with the wet cloth for this final smoothing in quirks too small for the fingers to deal with. Enriched parts, and mitres may require "trimming" with a modelling tool or penknife point where occasionally too much of the thick white may have been applied, and their sharpness or clearness interfered with. Small pieces of picked pumice stone cut to the shapes of mouldings, etc., may be used in place of or in addition to the glass paper to effect more perfect surface upon the plainer parts, and may be used while applying the thick white or with water after the latter is dry.

The thick white is best laid on with a camel hair mop for the smooth parts and a soft hog hair tool for the enrichments.

When this process is complete there should be about one-sixteenth of an inch thickness of whiting on the work, all told, and the surface should be as smooth as polished marble.

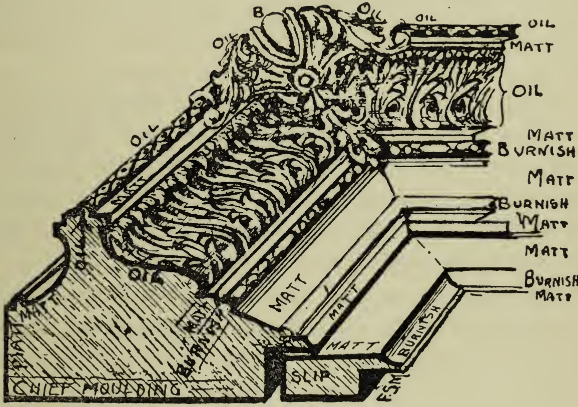


FIG. 9. CORNER OF A FRAME.

THE GILDING of our sample frame in hand comprises work done by each of the three processes named.

First complete the oil gilding, next the matt, and lastly the burnish gilding. Oil gilding is, in frame work, usually confined to intricate carved work or enriched mouldings, while smooth flats and round moulds are matt gilded, and prominent rounded parts such as knobs, beadings, and sometimes small hollows are "burnish gilded." When more convenient the matt and burnish *gilding* may be done both at the same time, though the gilding sizes are distinct compounds and must be laid in separately. Their order may be reversed for sufficient reason, such as when a small hollow has to be burnished and matt gilding comes on each side of this hollow, then the matt gilding follows instead of preceding the burnish gilding, though the actual burnishing process is still the last of all to be done.

OIL GILDING in picture frame work must be preceded by two coats of *clear size*, of the same nature and strength as that already used in the bodying up, taking special care that each coat is thoroughly dry before applying its successor; also that the surface is free from dust.

Next apply old oil goldsize thinly and evenly over (only) the parts to be oil gilded, using a soft hog hair brush, taking pains to cover all the depressed parts as thoroughly as those in relief, and to avoid causing "runs" of the goldsize into the crevices.

Note.—Only the best quality of old fat oil goldsize which holds its "tack" for at least three days should be used for this class of work. Any other gives rise to difficulties in the gilding. (It should be strained through fine muslin before use).

While applying this goldsize to the selected parts of the frame, care must be taken that no spot or smear of the oil size be allowed to get on to other parts of the frame, as they would interfere with the matt and burnish sizes applied later, causing lack of adhesion and shadiness in the gilding. If by mistake such accident should occur, wipe off at once while wet, with a dry cloth, and then, with a wet pad of soft calico, go over the length a few times; (in case of considerable difficulty apply two more coats of thick white to the whole length of mould on which the damage has occurred).

The correct time for laying the gold leaf upon the oil goldsize must be carefully ascertained as explained under "oil gilding" in Chapter IV.

Apply the gold leaf by the "tip and cushion" process only (see description in special chapter), and cut up the leaves into such sizes as will most conveniently be adaptable to the shapes and irregularities of the work, gilding all hollow and depressed parts first, not attempting as a rule to cover high relief and hollows both at one operation, though in very low relief with care and practice this may be done with fair success. One side of a deep hollow and the relief edge above may generally be covered at one time by a practical gilder, but the beginner will find that these methods of economising time and gold will suggest themselves by experience.

When the oil sized parts have been carefully covered all over with gold leaf, the whole should at once be dabbed down with a camel hair "dabber" (see Chapter II.), into close contact everywhere with the mordant, commencing at the point where the gilding was finished and "dabbing" in the reverse direction to that in which the gold has been laid so as to close down all the joints where the leaves overlap. If the wrong direction is taken the "overlaps" may be turned back and broken off before the joints are securely fitted, with the result that *patching* will have to be done, and the less of that the better for the appearance of finished work.

The *skewing bag* should be brought into use at this stage to catch the waste gold that becomes detached by the dabber, which may now be used as a duster to bring out all the loose bits of gold from the quirks and crevices, into the skewing bag, as these must all be cleared away before commencing the matt gilding of adjacent parts. Any defects that have occurred in the laying of the gold, such as cracks (usually in crevices and low parts), or holes in the leaf, will now become evident by showing the goldsize where gold should be. These may be repaired at once by applying fresh leaf either from straight bits of "skewing" or from the cushion, for which "*faulting*" process a short camel hair pencil, used in the same way as the tip, saves time by acting as a dabber, at the same time being easily used down in the crevices where the tip could only be used with difficulty.

This completes the oil gilding, which is seldom second coated as the oil size mordant required would neutralise the benefit of the undercoat, on account of its "covering" power, and its destructive effect upon the lustre of the gold even though the colouring matter were omitted.

ORMOLU SIZING.—This is a process of colouring and protection applied to most gilded work in the branch under immediate consideration, and this may be applied over the oil gilding just described, before or after the process of matt gilding. It consists in applying a thin coat of the *clear size* to which has been added about one-tenth its bulk of ormulu (see Chapter I.), which may be of such colour (or colourless) as best suits the object in view. It is applied hot and in a warm atmosphere to prevent any "bloom" as the result of a cold draught while drying. A camel hair mop is the best brush for applying this, and should be kept for this purpose alone. Reserve some of the same mixture for the matted parts that are to follow. A little dry vermilion or moist gamboge is sometimes added to this mixture to affect the colour of the gold to suit requirements, and "glair" is occasionally used in place of the parchment size (*Glair* is described in Chapter I.).

This size or ormolu finishing is also known as "glazing."

MATT GILDING.—The process of matt gilding is that which calls for most practice and most care of all that I have to describe, though its description is not so lengthy as some others.

The method of preparing matt goldsize is fully described in Chapter I.

Directly upon the surface of thick white, prepared before the oil gilding just described, apply from three to five coats of matt gold size, each quickly applied and as thinly as possible while the size is hot, using a camel hair mop. Take care that no dust is on the work to start with, and also that the smoothness of the surface is maintained by careful handling of the brush in applying the matt size. Each coat of matt size must be quite dry before the next is applied and even in a warm room, at least two hours should be allowed for the drying, or the next coat may *turn up* the present one and cause a roughness of surface difficult to deal with. In such an event there is no good way of repairing but leaving it to dry and then glass-papering the whole length down level, and repeating the matt sizing from first coat more carefully.

When the full complement of matt size is dry it is ready for gilding, as explained below. Three coats of matt may be sufficient in cases of urgency, but four or five should be given, if possible, as the power of the mordant and the solid appearance of the work is more perfect with each coat up to five or even six, if the bodying up should happen to be somewhat too absorbent.

The application of the gold to matt size may be accomplished at any time after the size has become dry, and closely resembles the principles already described in glass gilding. The mordant is already on the surface that has to be gilded, but it is dry and impotent, until quickened with moisture. It is therefore necessary to moisten it before applying the leaf. But its absorbent nature causes the surface to become dry again very quickly, hence the necessity for quickness and other details described below.

Gilding on matt size can only be done by the tip and cushion method, and these tools with a supply of leaf placed ready for use within the screen of the cushion must be at hand before damping the size. The latter is done simply with clean *cold water* (iced in tropical climates, or in very hot weather,if convenient) as warm water would soften the size and cause trouble. A camel hair mop is used for the damping and only so much as can be covered with one leaf at most should be made damp at one time. Pass the brush over this portion two or three times with fresh water each time and apply the gold with the same movements and accuracy as described in chapter under "Glass Gilding," but placing the leaf into actual contact with the surface in its intended position with the tip while the surface is "*flowing wet*" from the damping brush. Expert gilders expedite this movement by cutting up the leaf into its intended sections before commencing to damp the surface of the size, and further minimise loss of time by holding the tip between thumb and finger (even carrying thereon the first section of gold leaf to be applied) while at the same time, with the camel hair mop grasped (dagger like) by the lower finger of the same hand damping the surface with its free supply of water. Each leaf of gold should stretch out quickly, as in glass gilding, to its fullest extent immediately on touching the wet surface if adroitly applied, and should, as before, slightly overlap its neighbour. If a slight fault is noticeable, due to a crack or hole in a leaf, it may be repaired at once by applying a fresh cut piece of leaf and if necessary damp the spot carefully with a small camel hair pencil kept handy for the purpose. All other details are identical with the methods already described. For superior work a *second coating* of gold is always applied in matt gilding, and the result quite justifies the cost. This is applied after the first coat has dried, been " dabbed" and polished with a pad of fine cotton wool and then the process of gilding is repeated exactly as in the first coating, except that weak clear size, used warm, takes the place of the cold water for damping. The gold is left as before to become thoroughly dry, and is then dabbed down and polished with a pad of cotton wool, after which it is *ormolu sized*, as described for the finishing of the oil gilded portions.

BURNISH GILDING.—The process of burnish gilding is precisely the same as just described for matt gilding, with a slightly altered compound in making the size. To the first mixing of the paste size a little blacklead is added to assist the burnishing tool in bringing the gold to the highly perfect state of smoothness which is known as " burnish," and in order that this may not be interrupted by too strong a size, the clear size is reduced by one-fourth its bulk of water before adding to the paste to form the working size.

The process of the actual burnishing of the gold must be accomplished immediately the gilding is dry and before the size coating underneath becomes hard, or the work may be very difficult if not impossible of accomplishment.

First dab and gently polish with the pad of cotton wool as in matt gilding and then take the burnishing tool (see Chapter II.) and *gently*, but briskly, rub the surface inch by inch, systematically treating the surface from one side to the other until the desired result is obtained.

Do not rub hard or the gold may be removed. A very little practice makes this process easy. The chief danger always present is a slip of the burnishing tool on to other work, either oil or matt gilded, which adjoins the burnished work, and a consequent damage involving fresh gilding of a whole length to perfectly repair.

Burnishing is accomplished with different shaped burnishing tools to fit into and around various parts according to their contour.

The most universally useful shape is that illustrated in the chapter on "Tools and Appliances."

Burnished gold is never clear-sized or ormolu-finished as that would entirely counteract the effect that has cost so much trouble to achieve.

Matt and burnish sizes have a tendency to congeal rather soon during application, and must be applied dexterously while hot to secure a smooth surface.

TO WASH WATER GILDING.—Matt and burnish gilding in common with all other water gilding may not be washed with water, but may be cleaned and revived at any time by a *gentle* sponging with spirits of wine, or turpentine, which may remove the ormolu finish, but that may be afterwards replaced by the application of another coat of ormolu sizing as described above.

If rubbed too hard or continuously this washing process will remove the gold. Hence very great care must be used in cleaning.

Compo Repairs.—Picture frame gilders (usually known as "carvers and gilders") are not now, as formerly, required to be wood carvers as well, but they are expected to be able to make ornamental details in "compo."

This material may be made as required (see Chapter III.) or kept in bulk in a damp or moist place, and softened by steaming for some time over boiling water as required for use.

The ornamental features such as enrichments, corners, swags,festoons and other decorative details of frame construction are now almost universally made of this material which is cast in moulds made generally of boxwood for permanent use, but also of plaster, and even of the compo itself, for temporary use, and of gelatine or roller composition for very intricate undercut work, so that the mould may by its pliancy assist the casts out when completed.

Most frame gilders make up their own designs of ornament and cut the moulds in boxwood, or model the ornament in plastic clay and take a matrix (or mould) in plaster or other material from that, and then from this matrix (or mould) they cast the compo ornaments as required for corner pieces, etc., or in some cases they cast many at one sitting and lay them aside to dry, to be taken out, softened with steam and applied to work as occasion may require.

These compo ornaments, when softened, will easily bend into the shape of surface they have to fit, as seen in the application of corner pieces over ogee and other shaped mouldings, and they soon harden, retaining that shape permanently.

It is only necessary, therefore, to secure these with strong glue to the frame after it has been bodied up " in the white," (a process not needed over the compo, and much easier to accomplish before the ornaments are fixed). When dry and set securely it is usual to apply mor ecompo as a putty underneath the ornaments so far as may be without obtrusion, in order to prevent easy breakage.

In moulding or casting with compo it must be made into very soft pliable condition and systematically pressed in with the finger tips to make sure of all detail being reached, and more than enough compo allowed to remain over all when filled, after which a flat board is wetted and laid on the compo, and the whole put into a screw press, to be further pressed by the screw for a few moments, driving the compo into every crevice of the mould. When taken out of this press the board will be found adhered to the compo, and by a little practice may be used to lift out the casting quite perfectly. Allow this to remain on the board for a while to partly set and when sufficiently set, though still pliant, it may be removed by cutting off with a knife or a length of fine wire held taut between the hands.

The piece of compo left on the board may be used again.

To prevent compo from sticking inside the moulds the latter should be slightly oiled with olive oil before the casting and afterwards washed out with turpentine, using a soft camel's hair pencil for each process. New plaster moulds should be coated inside with patent knotting, and afterwards oiled as just directed.

Repairing broken or damaged ornaments in compo calls for a special mould to be made. This can be done by covering with compo, another part in which the same ornament is still intact, pressing down as perfectly as possible into every detail and leaving it there to set, removing it when hard, and this forms a matrix from which a new casting can be made. It will be necessary to oil the part that is to be so covered in order that the matrix may not adhere when dry. Use ample quantity of the compo for each matrix to avoid inaccuracy of detail. Plaster moulds may be taken in a similar manner if preferred, but that would require a little more dexterity as plaster so quickly sets. Flying (or semi-detached) ornaments may be strengthened by securing a length of wire to the back fixed by a support of more compo.

As soon as newly made ornaments are dry they should be cleansed from any traces of greasy oil that may have been brought from the mould, by a gentle washing with turpentine, using a camel hair brush for the purpose.

Compo requires no whitening up preparation if properly made and well cast, as either oil goldsize or matt and burnish assimilate with its ingredients and produce best possible results in gilding.

Carton Pierre and Papier Mache are sometimes used for moulded work in this branch and are treated as to gilding exactly as compo. The results are seldom equal to those of gilding on compo, which they sometimes replace on account of comparative lightness.

CHAPTER VII.

MISCELLANEOUS METHODS.

Clear Size Gilding.—The laying of gold leaf upon clear water size is not confined to glass gilding, and the mordant dissolved in the water for other work, such as illuminated addresses, *gilding on leather* or on fabrics, may be any of the clear sizes already described, or may be composed of the white of egg, the yolk of egg, or both combined, to be beaten up and mixed in the proportion of one whole egg to a quart of warm water for gilding of broad surfaces (while flowing wet) and made into a creamy paint with fine gamboge, a little glycerine and water in case of gilding fine tracery work such as *illuminated manuscripts*. In the first case the application of the gold resembles the process described for glass gilding, such as gilding all over the surface of fine leather, and in the second case the glycerine retards the drying of the size for a sufficient time to enable the artist to size-in a reasonable amount of work before laying the gold, which must be applied while this mordant is still wet, using the tip and cushion, just as in gilding on matt or burnish size. When this latter gilding has to be burnished, the mordant must be used weaker, and the burnisher used with special gentleness of touch. The gilding must be allowed to dry before being " skewed " or dabbed.

Cardboard Mounts for pictures are sometimes gilded all over and these may be done either in oil goldsize, japanners', or matt size. For the former (and the latter in urgent cases) a coat of patent knotting all over the surface as a preliminary preparation, and the goldsize used directly upon this, makes a durable and good job.

For matt gilding, however, it is better when time permits, that the work be done exactly as already described under "frame gilding." Clear size or ormolu to match the gold frame enclosing it, in either case.

Thin Paper is gilded all over by securing it level upon a slab and soaking with isinglass size, gilding with tip and cushion, as in glass gilding, being dabbed and polished with cotton wool when dry. Afterwards this is used for cutting up into strips for pasting down on to the edges of bevel-cut picture mounts, and for festival decorations in churches, etc. *Gilt edges* to the leaves of a book are similarly produced, the leaves being under compression during the process.

GILDING ON LEATHER.--Fine qualities of leather are sometimes gilded all over for making up into fancy dress shoes, harness trappings, and other decorative purposes, and the process of gilding is operated as follows :—

First soak the leather thoroughly in water and then stretch to its utmost area upon a suitable board, tacking it down to maintain the strain until dry. Next apply a coat of strong, hot parchment size. When this is dry apply glair as a mordant and apply the gold with tip and cushion at once while the glaire is wet, after the manner described for glass gilding. When this is dry dab down and polish with a pad of cotton wool. Finish with a coat of spirit lacquer quickly applied in front of a stove or in a very warm atmosphere. For gold leaf the lacquer must be colourless, but for common and cheap work the use of silver leaf takes the place of gold, and this is brought to the colour of gold by using a deep gold coloured lacquer.

GOLD BLOCKING.—*Gilded patterns on leather*, such as borders, lettering, etc., are produced by impression with hot metal dies, a process known as "gold blocking."

The leather is first prepared by a thin coating of glaire. This is allowed to dry and is then rubbed over with an oiled pad of soft cloth (sweet oil being most suitable). The gold leaf is laid upon this, from the tip and cushion or direct from the book (see "Methods of Application") in sizes made to suit with the minimum of waste, and the heated metal die is brought into contact with the gold under a steady pressure which drives the pattern raised upon the metal die so far into the leather and packing-board laid purposely underneath, that the pattern becomes permanently impressed in the leather. At the same time the heat of the die unites the oil with the glair size and the gold with both, leaving those parts not impressed quite as free from fixed adhesion as before. The surplus gold is then easily removed with a soft cotton pad along with the oily coat laid on the surface, after which the glair can be similarly removed with tepid water and a fresh pad.

Varnished leather may be much easier ornamented with gold. All that is necessary is to damp the surface, apply the leaf and impress with the heated die which sufficiently softens the varnish to create a momentary adhesive power which secures the gold and the surplus is afterwards easily removed with a damp pad of cotton wool. The most suitable varnish for this work is that known as leather varnish (otherwise French spirit varnish) as it contains a small proportion of linseed oil which other spirit varnishes do not, and this causes adhesion of the gold at a lower temperature.

The correct heat for the die in this class of work is gauged by wetting the finger and touching the metal. When at the right heat this will just hiss without burning the finger.

Another method of gold blocking and the simplest of all, is to sprinkle the surface with a fine powder of a resinous nature (known as "blocking powder"), manufactured for the purpose, and supplied in three shades and qualities (see Chapter I.) The gold leaf is laid upon this powder and the die is impressed upon the leaf. The powder fuses under the gentle heat and the pressure unites it to the gold and the groundwork. The surplus powder and surplus gold are easily dusted off without trouble or further loss of time. This process of gold blocking is largely adopted in the making of advertising show cards, window tickets, etc., and in book bindings it applies equally well to all kinds of cloth or leather.

Gold blocking of the names upon *lead pencils* and the like is done in a similar manner, the varnish acting under heat and pressure as a mordant.

Hat leathers and many other " block " pressed ornaments or advertisements are now gilded by the use of these " blocking powders " both for gold leaf and metal leaf work, as all preliminary preparation is thus dispensed with.

RAILWAY AND ROAD CARRIAGE GILDING.

Special Methods.

On account of the extraordinary wear and tear to which passenger vehicles are nowadays subjected, gilded embellishments must be protected with varnish. This so far reduces the natural metallic brilliance of the gold that a method known as gilding "on the varnish" is sometimes adopted. This without the subsequent coat of varnish would lose its hold on the leaf after a few weeks' exposure, and allow the gold to be washed off by the repeated cleaning these conveyances require. But the varnishing over the gold afterwards counteracts these failings entirely, and does not so far reduce the lustre as would be the case were the gold applied upon either old oil or japanners' goldsize. The use of " ribbon gold " facilitates this process.

Gold Transfers.—This gilding process is a " transfer " of the exact quantity and shape of gold required and no more, from the prepared paper by which it is carried upon the under coating of varnish in correct position, while just on the tack, before its hardening stage sets in. The exact positions are clearly marked upon the flatted surface beforehand, underneath that coat of varnish and "transfer" coats of arms, crests, monograms, ornamental designs, etc., are applied and pressed into closest contact with the tacky varnish, the paper damped and withdrawn from them leaving the gold (with colours also) fixed upon the varnish. Gold lining can be similarly applied by carefully cutting up leaves of transferred gold to the *exact* widths of the lines and applying with accuracy to their destined position (curves and bends being cut to proper templates taken in advance).

POWDER GILDING.—Without entering into the chemical deposit form of powder gilding, such as employed in china and pottery embellishment, we may gain by a knowledge of simple "powder gold," as described in Chapter I. and its mode of application for special purposes.

First it must be noted that if made as it should be (as directed in our opening chapter) this is the most expensive form of gold, and of gilding. But the results fully justify the cost on such work as illuminated manuscripts, very intricately ornamented small frames for miniatures, and other valuable gems of art work.

The application is strangely the most simple while the result is the most rich of all methods within the scope of this book, The powder gold is simply mixed into a creamy "paint" with a little weak "gum water" and applied to the work. If it is desired to *burnish* this gold upon manuscript paper all that is required is that the gum water shall be weak enough (made from pure gum arabic dissolved in water to a thick fluid,and one drop of this fluid mixed in a teaspoonful of water). Then the burnisher will bring up a highly lustrous finish.

It is on delicately enriched or finely carved work that this shows up to perfection. First coat the work over with two or three coats of "French burnish" (a mixture of Armenian bole and other materials which include some lubricant such as suet, glycerine, or olive oil) the nature of which is known only to the makers. This powder gold will burnish well at any future time if the mordant is not too strong, without any preparatory coating. But in order to obtain the full matt richness to contrast with the burnish and to produce a most lustrous surface, the "French" burnish size mixed with weak gum water or parchment size should be applied. Then the powder gold as a water paint (if on the burnish size half the strength of gum water will suffice) and when dry use the burnisher upon prominent edges or features, howeve fine or broad, and you will have a *matt and burnish* finish equal in appearance to solid gold or the best electro-plate.

CHAPTER VIII.

METHODS OF APPLICATION.

GOLD LEAF may be applied to the face of the mordant ready to hold it, by special methods known respectively as "*tip and cushion*" *method*, "*transfer*" *method*, "*gilding from the book*," "*hand laying*" and "*ribbon gilding*."

TIP AND CUSHION METHOD.—The tools used in this process have already been minutely enumerated and described.

It has been explained that the cushion has to be held on the left hand, supported and guided by the thumb-strap fixed underneath and by resting on the outstretched forefinger (shown by dotted lines in Fig. 3) while the lower fingers hold the "tip" and the "knife" that have to be alternately brought into use by the right hand.

The beginner should be content at first to put out about a dozen leaves of gold into the screened off part of the cushion. To do this, take the book of gold leaf flat upon the left hand with its binding towards you, holding it with the thumb of the same hand resting on the stitched edge, and with the right hand turn over one leaf a ta time, allowing the loose leaf of gold to fall gently on to the cushion within the screen, assisting it, if needed, by a gentle puff of the breath.

When sufficient for immediate use has been so placed, bend down at one corner all the leaves of the empty part of the book, so as to find the remaining gold leaves, when required, without danger of omission or accident.

See that the knife and tips are clean and dry. Of the latter three sizes will be useful. Moisture or rust on the knife will destroy the gold leaf in cutting.

Having these tools all ready for use and the mordant fit to receive the gold, take one of the leaves of gold from the screened part of the cushion by placing the point of the knife under a loose edge, lifting it easily, and lay it down upon the open working end of the cushion without folds, and then by a gentle "puff" of the breath spread it out quite flat against the bed of the cushion, in such a position as practice will prove to be the most convenient for cutting up as required.

At first the beginner blows too hard upon the leaf and disperses or at least crumples up the leaves within the screen, and at the same time may tear the leaf under immediate operation. But a little practice will soon enable the workman to gauge the correct knack of this. A greater danger exists in the possible occurrence of similar accidents from ordinary respiration, which must be so controlled that no expiratory breath is directed upon the cushion at any time during the progress of the work. For the same reasons as already explained the use of tip and cushion gilding cannot be conducted in a draughty place, as gold leaf is so light that a slight draught will carry it away to its probable destruction.

In case of accident of this kind do not hasten to catch or pick up the fugitive leaf, and do not try to pick it up with the hands, to which it would stick and become useless, but quietly follow with the gilding knife and pick up as already described with the point of the knife, gently replacing the truant leaf upon the cushion.

When laying out the leaf for cutting, at the working part of the cushion, it will sometimes happen that there is a fold or awkward wrinkle in the leaf that would (as experience will soon teach) cause a tearing of the leaf when "puffing" down as above described. In this case the leaf should be turned over before "puffing," easily accomplished by causing a very slight draught with a short, sharp rap of the knife blade at one side upon the bare cushion, and smartly passing the knife under the leaf by the same movement.

Assuming now the leaf to be ready for cutting (quite flat and square upon the leather bed) look at the work and decide how many widths you may cut from the 3¼ in. square awaiting the knife. If the shaft of a letter or a line measuring 1½ in. wide be under treatment then one cut across the centre will suffice. If a similar line of 1 inch width, then cut a leaf into three equal sections and so on. Again if shorter pieces than three inches in length are required it will be necessary to cut the leaf transversely in addition.

Note.—Each section of leaf should be cut a little larger each way than the space it is intended to cover. The correct method of cutting and the cleanliness of the cut depend upon practice more than upon rule. But first it must be noted that the knife need not be sharp. A table knife that has become too dull to cut meat easily is about sharp enough as a standard for the gilding knife. Hold the knife at an oblique angle across the leaf with its point upon the bare leather at the opposite side, and by looking at it from above decide the correct line it must take, then lower the blade upon the leaf and with firm (but not too heavy) pressure draw the knife an inch or so towards the operator, lifting the knife smartly and vertically from the leaf at the same operation. If at first this appears ineffectual repeat the operation with a return movement of the knife, pressing for an inch or so likewise in the opposite direction before raising from the leaf. Some workmen draw the knife at first cut until it entirely clears the leaf. Any of these methods will be successful after a little practice.

The conveyance of the leaf or its sections from the cushion to the mordant is accomplished by the little brush called the "tip." These are made in various sizes as to length of hair, all being of the same width (3 in.) so as to carry a section of the full width of the leaf, though special sizes may be had to order when, as sometimes occurs in lithographic or bookbinders' work, specially large leaves are dealt with. Tips of thicker layers of hair are also made for silver and other metal leaves of greater thickness and therefore of heavier weight than gold leaf.

During the blowing out and cutting of the leaf, the tip is held between the fingers of the left hand under the cushion, and when required is adroitly made to exchange places with the knife in the right hand, then it is passed lightly across the hair of the head so that the hairs of the tip may acquire a *slight sensation of greasiness*, in preparation for which the workman with naturally dry hair applies a very small quantity of grease, well distributed upon his hair (or beard) in advance.

Apply this to the leaf, or section of leaf, so as to leave a very narrow margin of gold projecting beyond the tip (see Fig. 4)—this to enable the operator to see exactly how he is placing the gold upon the mordant, and also to protect the mordant (especially in water gilding) from acquiring any of the grease from the tip, which would probably interfere with its functions. The gold leaf will then adhere temporarily to the hairs of the tip and may be carried with ease thereby to the surface of the goldsize, whose greater adhesive power will take the gold from the tip immediately it comes into contact with it. Continue this system by gauging the necessary cutting up to the leaf and applying each section to slightly overlap its neighbour, finally dabbing down the leaf and finishing as directed in separate instructions for each variety of size and process, described in detail elsewhere.

Note that if the tip is allowed to get damp or to gather too much grease from the hair it will result in the gold leaf adhering too tenaciously when being conveyed from the cushion, and instead of adhering to the goldsize it would remain on the hair of the tip. In that event press the tip between two sheets of blotting paper until the surplus is removed.

Two or three sizes of tips will facilitate the work, using that with very short hair when gilding long narrow lines (some of which require each leaf to be cut up into ten or twelve sections) as the narrow strip of gold is much more easily carried and applied with these short haired tips. The reverse is, of course, the case with the larger sections while the whole leaf should not be attempted without the " double " tip (described in Chapter II.)

NOTE.—When cutting up a leaf into an even number of sections it will facilitate accuracy if it is first divided into two equal parts and, when convenient, again sub-divide each half on the same principle until the final sections may be easily gauged with fair accuracy. It is well to remember that each leaf measures 3¼ in. and for cutting up purposes this should be calculated as 3 in. to allow the small margin of extra gold already recommended for its application.

Do not attempt in this kind of application to cut up the leaf so economically as to avoid any waste, by trying to cut the leaf to shapes of curved and ornamented parts. Beyond an occasional triangular section cut across the corner of a leaf, it will generally be found most economical in the end to use the smallest convenient rectangular section that will cover the part.

"TRANSFER" GILDING.—This name is applied to the application of gold leaf that has been previously secured temporarily upon sheets of tissue paper rather larger than the leaf (see Chapter I.) These are carried in a small box or tray slung in front of the workman or otherwise handy, but leaving the workman. with both hands at liberty, one to hold the leaf in contact with the surface and the other to use a little pressure upon the back of the tissue in order to transfer the gold from the paper to the mordant, to effect which he uses either the tips of his fingers or a small pad of cotton wool. The tissue paper being semi-transparent, allows the operator to see when the gold has all been properly applied,and to ensure perfect work he may raise one-half the tissue at a time, returning it exactly in its correct position to complete the transfer when it is seen that some part has been omitted, through either inequality of surface or by his own oversight. This kind of gilding enables the gilder to utilise almost every scrap of the gold as the surplus will generally all remain upon the tissue. This can be seen from the reverse side and applied where suitable parts admit the use of small patches.

This method is the most economical of all where gold leaf is concerned and is most largely in evidence next to the "tip and cushion" method last described. It cannot, however, be applied to any form of water gilding with practical success, and even for the work in which it is most used, its surface has never quite the same lustre as distinguished the work of "tip and cushion" method.

This slight difference, however, is often of less consequence than speed and economy, which are distinctly in favour of "transfer" gilding.

APPLYING "TRANSFERS."—Though so similar in title and somewhat similar in method, this heading describes a totally different subject to that of "transfer" gilding just described. Many elaborate coats of arms, crests, trade marks, emblems, monograms, and even some plain lettering, are applied to varnished, painted and polished surfaces and to glass, by being first printed upon prepared paper with gold or other metal leaf introduced, as well as colours, and from this paper transferred in their complete form upon the surface intended to receive them. For this purpose the surface has to be first varnished, and when the varnish is "on the tack" (*i.e.*, dry, but not hard) the transfer paper is damped and the superfluous moisture removed by gentle pressure between two sheets of blotting paper; then it is laid upon the tacky varnish and dabbed into close contact all over with a pad of cotton wool.

It is then left overnight or for a few hours to become firmly attached to the varnish, when the paper may be soaked off by cold water and sponge, leaving the ornament in all its detail upon the varnished surface.

Needless to say, the correct position for the ornament should be determined and marked *before* varnishing, and corresponding marks be made on the transfer paper in order to avoid any mistake which it would be manifestly impossible afterwards to rectify.

Many firms make a speciality of these transfers, which are largely used by railroad companies, carriage and tramway car builders, sign specialists, cycle makers and others who require considerable repetition of ornamental decoration, for which this class of work is eminently satisfactory and comparatively of very small cost. It is generally made more secure by a coat of varnish being applied over it when the undercoat is hard.

GILDING FROM THE BOOK.—When applying whole leaves, such as upon solid gold backgrounds, intricate lettering and ornament, letters with broad shafts or upon broad mouldings, some gilders save time by taking each leaf upon the double tip *direct from the book* without the intervention of the cushion. Where a considerable quantity of broad work has to be done this is recommendable, and requires no special instruction beyond that already covered by tip and cushion gilding. A second method of gilding from the book is to dispense with the tip altogether and apply the whole leaf by holding the book in one hand by the stitched edge, and lifting the paper leaf with the other, half way at first, thus holding the metal leaf secure until its bottom edge is attached to the mordant. The whole page is then opened and the metal leaf fully extended upon the size by a slight upward movement of the book. The next page is made to follow by similar manipulation, and so on to the end of the book. It will be seen that gilding in this case is operated from the bottom upwards for convenience of handling the gold, while by other methods the reverse order maintains. This latter method cannot be adopted with success in water gilding, nor can either method be recommended for outdoor use, as the wind would probably cause more damage than would be covered by the economy effected in time.

Hand Laying.—This is a method similar to the last named, but quite unsuitable for applying gold leaf for reasons already sufficiently explained. It is, however, quite applicable to all other metals, and is largely adopted for metalling relief decorations, and other surfaces with silver, aluminium, Dutch and schlag metal and gold substitutes which, as a rule, are much thicker and heavier than gold leaf, and are therefore handled without damage if ordinary care be exercised. In this method the leaf is simply taken by hand from the book or packet, and laid upon the mordant ready for its reception. Hand laying is fit only for indoor use.

Ribbon Gilding.—This process applies only to the speciality known as "ribbon gold," which is practically a transferred gold of continuous length and in a variety of widths made up in rolls resembling the familiar rolls of silk ribbons indispensable to the milliner. To use these they are mounted upon a mechanical contrivance known as a "gilding wheel," obtainable from the same source as the gold. This facilitates the easy unrolling and application of the metal to the work (see next chapter).

Applying Bronze Powders.—These powders will readily adhere to almost any material, and may therefore be conveyed in many ways to the mordant. The best way is that which assists to secure the most brilliant and perfectly finished appearance. Experts, for this reason, prefer a pad or ball of finest cotton wool, or a hare's foot. But a pad of velvet or soft cloth will do nearly as well, and a camel hair dabber will make a good job in case of need. The author prefers a small pad of bleached cotton wool to any other tool for the purpose.

CHAPTER IX.

RIBBON GILDING.

By the name of "Ribbon Gilding" is known the most modern method of applying metal leaf (both gold and other metals). Ribbon gold has already been described (see Chapter I.) as a continuous ribbon of gold mounted upon a continuous roll of thin paper in the same manner as seen in the stocks of silk ribbons and the like in the drapery and dry goods stores.

So popular has this process become that not only three shades of gold leaf, but aluminium and gold imitation are now manufactured and stocked in many widths to suit various purposes.

The process of ribbon gilding is so simple to a practical man that it seems almost superfluous to issue any "directions for use" which accompany the first supplies of this material as usual with new systems of work.

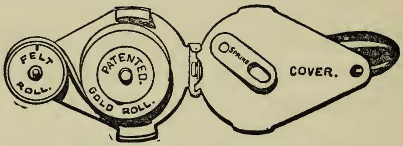
All that has to be done is to adjust one end of the "ribbon" to the commencement of a line of gold size, when ready for gold, and roll the "wheel" of ribbon along to the other end with care to keep within bounds of the gold size. Immediately the "wheel" is lifted from the work the gilding of that line is completed, and the remainder of the gold retained in the ribbon wheel is ready for other lines. All that has to be done then is the "polishing" with cotton wool, chiefly to remove the "skewings," of which, however, there should be only the veriest minimum after a little practice, as the makers supply the "ribbons" in widths varying by degrees of one-sixteenth of an inch from three-sixteenths to 3¼ in. The author recently gilded two members of a frieze of relief, one being a rail with jewels (or beads) at considerably less cost of time and material than would have been certain upon one-fourth the extent of work gilded from the cushion.

The rapidity, however, with which the work can be turned out and the excellence of surface produced are the chief attractions of this method. Some gilders acquire remarkable agility in the application of leaf by the older methods already described. But there can be no doubt of the economy of the "ribbon" process, which enables an expert to literally "ride" over the work at treble the quickest speed otherwise attainable, and quite tenfold the "ordinary" speed of the average gilder.

The gold (or other metal) is mounted quite loosely between the corresponding rolls of paper forming the reel, yet it adheres *slightly* to the working side of the paper during its application to the size. This is due to the special make of paper employed, one side being smooth and the other slightly rough, so that no difficulty is experienced in the continuity of a "run" during application.

The manufacturers also supply any of the metals actually "transferred" in secure adhesion upon the thin paper of the reels, after the manner of ordinary "transferred" leaf already described. This is described as "O. D." material, and enables the ribbons to be freely used on outdoor work, without fear of loss through wind or draught.

A useful feature of this material is the width of each ribbon of metal being exactly the same as that of the paper on which it is mounted, which does away with any uncertainty of its covering the space under treatment.

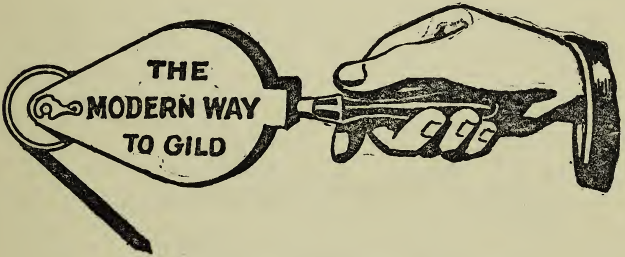


Coe's Gilding Wheel (Open).

Of course there is the necessity for disposal of the paper which becomes liberated as the metal is applied to the work. In using "Coe's Gilding Wheel" this surplus is automatically re-wound upon a second (empty) reel, which serves the double purpose of a "pad" in application (being felt covered) and receiver of the surplus paper, the latter assured by tucking the first end of the paper into a slot made for the purpose in the pad. This very simple and ingenious tool has been contrived to contain both the reel of ribbon gold and the pad, or felt covered working reel (see illustrations), and is known as "Coe's Gilding Wheel." It is fitted with a convenient handle which enables the workman to roll the ribbon leaf on to the work with one hand, alone.

This instrument is made strong yet light, and sold at a very moderate price. These are necessary considerations seeing that various sizes must be used for the different widths of gold.

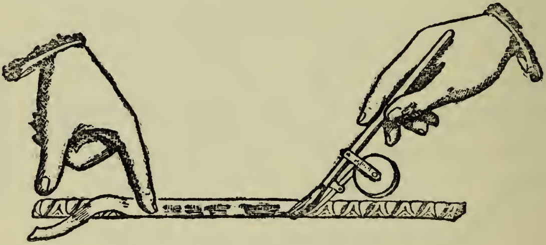
The application of metal to slightly convex surfaces may be successfully negotiated with this tool, but for concave surfaces an even more simple tool is brought into use, consisting merely of a suitable brush, with a bracket fixture upon it to carry the reel of ribbon gold, which is then applied by using both hands (the left to control the correctness and to gather up and frequently destroy the surplus paper), the right hand manipulating the brush so as to press the gold evenly into the concave moulding. For considerably convex surfaces this tool is also preferable.



COE'S GILDING WHEEL (IN USE).

Heavy enrichments gilded all over (as in picture frames), are better done by the older method of "cushion" gilding, but for more simply enriched mouldings (such as egg and tongue, pearl beading, etc.), gilded only a little beyond their "faces" the use of ribbon gold with this "brush" instrument carries out the work with the advantages already named, and often with more satisfactory results.

As already mentioned, there is very little waste gold necessary with this method, but for safety's sake it is well to have the ribbon one-sixteenth or even one-eighth wider than the actual space to be covered.



Coe's Gilding Brush.

It must be noted that this process can only be recommended for gilding upon "dried" size, such as oil goldsize, japanners' and writing goldsize, varnish, etc. By special dexterity it may be possible to use it for water gilding, but the risk of loss or damage from the paper adhering as well as the gold, renders the process inadvisable under present circumstances.

From the descriptions given it will be easy to understand that in gilding "lines," "beading," "mouldings," etc., lies the strongest claim of this process. But it is also of similar usefulness and advantage in gilding all kinds of flat surfaces whether for "lettering," ornamental stencilled work or for plain gold (or metal) backgrounds. In the latter kind of work its enormous saving of time is rivalled by increased solidity and freedom from "shades" at the joints of leaves often noticeable in similar work done by the older methods. The same remarks apply to the gilding of extraordinarily large letters.

In both cases the ribbon, whether gold, aluminium, or imitation, may be obtained the full width of the leaf from which it is manufactured (gold up to 3¼ in., and the two other metals up to 5 in.), or any lower sizes that may adapt themselves to the special nature of the work.

The ribbon gilding process has lately been adopted by bookbinders for "blocking" large work on book covers, and a special fixture to carry the gilding wheels is now applied to the die presses used by the trade, as it is found to effect a considerable saving in cost of this important branch, with equally satisfactory results.

The trades mostly affected up to the present time have been those of railway and tramcar building, engine and motor car building, etc., where literally "miles" of plain gold lines are applied to car sides, panels, moulds and beadings.

The three shades of gold in popular use are extra deep, medium, and pale, and these are issued as "stock" shades by the manufacturers, the W. H. Coe Manufacturing Co., of 27 and 28, Birkbeck Bank Chambers, High Holborn, London, W.C., and of Providence, Rhode Island, U.S.A.

The prices of these materials are so accurately graduated that they compare favourably with those of ordinary leaf gold and other metals, and the quality is of very high standard.

The gilding wheels and ordinary sized "gilding brush" cost 4s. 6d. each, and a larger brush one shilling more, so there is no serious hindrance to the adoption of ribbon gilding by those whose business may present opportunity for its use as a profitable addition to the gilding department.

The sole manufacturers and patentees, whose address is previously given, will no doubt supply any gilder with detailed price lists on application, and their courtesy will be found equal to the quality of their materials.

CHAPTER IX.

BRONZING.

By the term "bronzing" as here used, is meant the covering of any surface with metal in the form known as "bronze powder," of which a full list is given under the heading of "materials" in Chapter I.

There are two distinct methods of effecting this result. First, "*powder bronzing*," by applying a mordant to the surface and when this is on the tack covering it with the metallic powder, afterwards with a lacquer for preventing discoloration (the latter for permanent decorations, but omitted in work of only temporary importance). The second is "*bronze painting*," with a fluid mixture of the bronze powder with suitable mordants (see "gold paint," etc., Chapter I.). The former method produces the best and most durable work; but for hurried work or where continual hard wear calls for frequent renovation, the latter process proves adequate, and though less brilliant is still bright and less costly.

Some surfaces are covered all over with bronze; some are decorated in lettering or design of bronze; while others are merely faced (upon prominent parts) with metallic finish. The first named is largely effected by the "bronze painting" process, upon iron railings, theatrical decorations, etc., and the two latter are usually effected by the "powder bronzing" process, by which the most artistic results can be achieved.

It must always be remembered that bronze powders readily oxidise and so become discoloured if in direct contact with the atmosphere or on recently applied linseed oil, such as oil paint, or oil goldsize. Therefore in powder bronzing the mordant should be japanners' and not old oil goldsize, or made from adhesive gums with water, and they should not be applied on newly laid oil paint. In anticipation of the bronzing, any painted ground should be effected with quick drying paint made from pigments mixed with japanners' goldsize and turpentine to the exclusion of linseed oil, or with a washable distemper.

Printers' bronzing on paper, such as in printed labels, circulars, show cards, is done by first printing the design (or, in case of "all over" bronzing rolling the surface entirely) with ordinary strong litho ink, to which has been added half its bulk of terebine or japanners' goldsize and when nearly dry (in a few minutes) freely distributing the bronze powder all over the surface with a hare's foot or camel hair dabber, and removing the surplus powder by the same means after the drying of the mordant. Printing in colours usually precedes the bronzing, yet may for certain effects be usefully applied over the bronzed surfaces. For wall-papers and other continuous material, a "gilding box" is employed. This is a box containing a considerable quantity of the bronze powder kept in a continual state of agitation so that the prepared surface of the paper rapidly becomes covered as it passes (mechanically) through narrow openings at either side. It is completed before emerging from the apparatus by passing over a heated roller to dry the size, followed by its passage between soft brushes to remove surplus powder, which finds its way back into the original chamber. The exit is between heated rollers which add a burnished appearance to the bronzed parts. The mordant in this class of work is generally a "water size" of a "gum" or "glue" compound, varying as to detail according to the nature of the fabric and the fads of the operator; glycerine is added to retard too rapid drying; vinegar or oil of cloves may be added to "keep" the size from fouling, and colouring matter may be added to make the work more visible prior to the metalling.

APPLYING "SPECKLES."—Closely allied to this kind of work is that known as "post card jewelling" and show card illuminating with *bronze* "*speckles*." First apply a glutinous or "gummy" liquid where desired (a rather thick fluid being the best) and then while wet apply freely the speckles (a large variety of which is detailed in Chapter I.), dusting off with a camel's hair dabber when the cement is dry. A special cement for this class of work is known as Palmer's jewelling cement. Any of the popular adhesive compounds, such as seccotine, will act equally well and may be applied with a fine camel hair pencil, a pointed stick, or from a glass tube with a tapering point, annealed so as to prevent scratching. The latter is supplied ready made by Messrs. Palmer and Company, of Old Street, E.C., and is called a glass "jewelling pencil." Ordinary bronze powders may be applied in place of the "speckles." In this class of work the French "patent bronzes" are exceptionally suitable, on account of the extraordinary depth and beauty of their colours. *Shop Window Show Cards* can be made specially attractive by first raising the letters or figures upon the ground either by cut out card shapes, fine pearl sago, or broken cork powder (the cork packing from barrels of imported fruits suits the purposes) to be first fixed by the cement, then to be themselves coated all over with the same, and while this is wet, powdered or bespangled with selected bronzes. The "speckles" are very effective on this kind of surface. Another name for this class of bronzes is "tinsels" which are supplied by E. Winter and Co., 64, Cheapside, E.C.

Selection of Bronzes.—There is no particular difficulty connected with actual bronzing, though selection of material and for most artistic work the suitable limitations of its application require knowledge and judgment.

Bronze powders of best quality should be extremely fine and slow to oxidize. To test for fineness, touch the powder with the tip of a finger and rub on the back of the hand or a piece of rough paper, and note the distance to which the metallic lustre will spread. To test for oxidation lay competing samples over "tacky" *linseed oil* dried upon a piece of glass, and place for a week or two in the open air; or for more rapid result enclose the glass with samples so laid, inside a jar containing oxygen gas, and seal it up for a few days. The oxygen gas can be produced by gently heating a mixture of bichromate of potash with its own weight of strong sulphuric acid in a flask over a spirit lamp, and may be passed through a rubber tube (after the style of a child's feeding bottle), from the cork of the flask to a glass jar (such as a large jam jar) held under water mouth downwards—the oxygen gas will displace the water in the jar, which may then receive the samples and be corked up while still under water. The experiment is neither difficult nor dangerous and is very convincing.

POWDER BRONZING.—For artistic work it is often advisable to bronze only the "*facing*" of parts of the surface which stand out in high relief such as in statuesque work, gesso and other relief ornamentation, in which case first paint the whole work with finely made up quick drying colour, either a bronze green or brown old copper colour, then cover *the whole surface* with *japanners' goldsize*, and when this is just "on the tack" *apply the bronze powder with a ball of cotton wool*, vignetting off gradually where not required and well polishing with the cotton. When quite dry, cover the whole surface with a thin coat of spirit lacquer, and scumble immediately in the crevices with a dry pigment of lighter bronze green or of deeper brown according to the colour first employed, rubbing this in with a camel hair pencil and vignetting it off after the manner described for the bronze powdering. This completes so far as bronzing is concerned, and would be exceedingly durable.

Bronze Painting.—Under this heading comes the use of all "liquid gold," "gold paint," "gold enamel," "Ardenbrite," "Ellamite," "aluminium paint," and so on, where the metallic powder is mixed with the liquid mordant before application. If the mordant is a non-oxidising material this encases the powder, and for a very considerable time will prevent its tarnishing by oxidation. A coat of thin spirit lacquer increases the life of the bronze, as the mordant by gradual perishing or wear eventually allows the air to come into contact with the metal. Hence its quality is very important. There are many mordants suitable, but none maintain the brilliance of the metal quite so long as thin spirit varnish, though the very quick drying character of this renders it unsuitable for any but an expert "brush hand" to apply. The most suitable therefore is the next best, a mixture of japanners' goldsize and a volatile spirit being most favoured (see "bronze paint," Chapter I.). A mixture of shellac and spirits of wine to which a quantity of *amyl acetate* has been added is also a very suitable mixture, but this has so strong and pungent an odour as to be quite intolerable to many people. The comparatively small quantity of linseed oil contained in japanners' goldsize is rendered non-injurious by the process of manufacture of the goldsize.

Bronze painting is most suitable for iron railings and other exposed ironwork. That made from aluminium powder (such as "Ellamite" and "Oyama" paints) is exceptionally durable, and is used largely by ship and boat builders and agricultural implement makers.

ANTIQUE EFFECTS.—A good antique copper appearance is obtainable by first "grounding" with bright copper colour, glazing over this with black japan, rubbing the facings with antique bronze powder (copper colour), and scumbling in the crevices with Bismarck brown, after a thin coat ot clear spirit lacquer warmed while drying. A similar process with different coloured grounds and glazes will with the help ot the "antique" shades of bronze powders, produce an unlimited variety of antique metallic effects.

Similar effects to those of "facing" and "scumbling" just explained can be got by first bronzing "all over" upon a goldsize mordant, or by "bronze painting" and then glazing all over with a dark scumbling colour in water, wiping off the scumble from the high relief with a sponge and washleather. But the appearance is not so finished, and this process is therefore usually confined to friezes and other decorations at some distance from the eye.

These antique effects are specially suitable for *statuettes* and various *plaster cast ornaments*, after observing the directions given in Chapter III. for preliminary preparations; according to the nature of materials of which they are composed.

To Bronze Iron Railings.—New unpainted iron should have a coat of patent knotting, then be painted in quick drying paint prior to the japanners' goldsize and powder bronze, or the bronze paint as above directed. Old painted ironwork should have quick drying paint applied without the intervention of a coat of knotting. In all cases it scarcely need be said that all rust should be thoroughly removed prior to any other process, and that oil paint should not be used. In cases of urgency bronze paint may be applied direct upon the bare metal. But this does not look so well nor does it wear nearly so well as when a coat of patent knotting precedes the bronzing. Aluminium paints are specially suitable for this kind of work.

Stencilling in Bronze.—This may be done by mixing the powder to a stiffish paste with "gum water" and afterwards lacquering with spirit lacquer.

Another method is to stencil with a mixture of white wax and turpentine, which will have an adhesive surface when dry, and then dusting over with powdered bronze. The latter gives the most brilliant results and may be lacquered with care, avoiding the possible rubbing up of the wax.

Bronzed Lettering is generally avoided, being considered too unstable, but if well done upon a hard ground and finished with protective lacquers of varying colours there is no reason why this form of attractive advertising should not be in greater demand. It is quite profitable.

Provided the directions given for keeping back and front free from oxidation be observed, a very attractive fascia sign can be made by applying Alabastine relief letters of a foliated Gothic or other type upon a rough background, spangling the latter with "speckles" and bronzing the letters with rich coloured bronzes, to be varied tastefully upon different parts of the letters and protected by clear spirit lacquer. They might be surrounded by a gold edge, separately "gessoed" and gilded with gold leaf tor superior effect.

Aluminium "bronze," if a powder containing no copper must be so miscalled, is largely used for the last named purpose already, and likewise aluminium leaf. But the fact of its not being tarnishable need not prevent its being lacquered, scumbled or glazed, a treatment seldom attempted though easy and very effective. The dull lack of lustre which this metal acquires shortly after exposure is obviated by a clear lacquer, and carved or modelled letters offer facilities for coloured glazing which adds to their effectiveness, while their durability would equal that of any other treatment.

In all methods of applying bronze powder the three points essential to good results are *a hard inert ground*, *a quick drying mordant*, containing no free linseed oil, and a good *protective lacquer*.

A more extensive general knowledge of bronze powders and their possibilities would be an advantage to the various trades interested, as their application is so simple, and their variety of late years has been considerably extended.

The finest qualities are made on the continent, all attempts to equal them in Great Britain having so far fallen short of their high standard.

Among the largest importers and exporters of these products are Messrs. Reinemann and Company, whose London warehouse is 7, New Zealand Avenue, Barbican, E.C., and Messrs. Palmer and Company, of 82 and 84, Old Street, E.C.

CHAPTER XI.

LACQUERING.

BRIEFLY described, lacquering is a thin coating of shellac conveyed by a volatile liquid solvent, which eventually evaporates entirely away.

This desideratum is attained by the material known as spirit lacquer, a compound of alcohol and shellac, stained with various colouring matters when required to serve the dual purpose of protection and decoration. Further description of its composition will be found in Chapter I.

There are two methods of using spirit lacquers to suit different classes of work, and though both require the aid of heat, one is known as "hot" lacquering and the other as "cold" lacquering. The only difference is that in the first method the article under treatment is made hot, while in the latter the necessary heat has to be acquired from other sources, either by conducting the operation in front of a stove, or by a portable lamp made to warm the atmosphere immediately over the work as soon as done.

The hot process is the best and most durable as it drives the lacquer more closely into the texture of the material.

This necessity for heat during the few minutes immediately after application is due to a peculiar tendency of all lac preparations to turn milky while drying at a low temperature.

The *hot lacquering* is much the easier for the workman, as the heated material prevents the lacquer from taking a chill from a moderate draught, and dispenses with the necessity of handling a lamp while applying the lacquer. Articles of metal therefore are generally treated by this method, small articles being returned to a stove immediately on being finished, as they have a tendency to become cool too soon, but heavier articles retaining their heat for a considerable time are left to dry in the normal atmosphere.

By this method are produced many of the beautifully decorated tin cases now so popular for packing tobaccos, grocery and many other articles of commerce, by which the tin is made to appear like gold, copper, etc., according to the colouring matter added to the lacquer. By the same method also the finishing of brass and copper ornaments, electric and gas fittings, door and cabinet furniture, etc., is effected, and the lacquer becomes almost an integral part of the metal, not only adding to its beauty but considerably enhancing its durability.

Lacquering bronzed plaster casts and other small decorative articles that may be heated without danger to the fabric, should also be done by the hot process, carefully avoiding the over heating of materials that might crack. They need never be so hot that they cannot be handled without inconvenience, and ought to be tried with the bare hand while in the oven, taking out when they seem to be as hot as can be borne by the hand, and the lacquer applied without delay, returning small articles to the stove for a few minutes as soon as completed to keep warm until the lacquer is dry.

Cold lacquering must be adopted for articles of wood, paper, compo, leather, etc., which would be injured by the excessive heat of the stove. Under this heading come the popular relief decorations and the cheap mouldings for picture frames, known as German mouldings (though largely made in Belgium), papier maché ornaments, etc., which are first covered with silver leaf or one of the substitutes and then finished with a deep gold coloured lacquer.

For long lengths of decorative material an ingenious mechanical contrivance is used by the manufacturers to apply uniform heat with promptness and despatch. This consists of an inverted plate covered with small gas jets, under which on a bench a few inches below, the material passes immediately it is lacquered, remaining only so long as needed to apply the lacquer to another reach of the same length, which then takes the place of the portion under the gas jets, the latter passing along the bench dried free from the dreaded " bloom." This leaves the workman at liberty to give all his attention to the actual application of the lacquers, of which he may sometimes have to manipulate several colours at each shift, to produce the beautiful polychromatic colouring so frequently applied to this class of work. When such an apparatus is not available the workman may use a spirit "blow" lamp such as used by painters for removing old paint, care being taken not to burn the work, but keeping the air warm around the newly laid lacquer for three or four minutes at least. A portable "gas ring" with ample flexible tubing will answer if carefully managed.

Small articles such as panels of Lincrusta, wood and papier maché may be lacquered in front of a fire or stove, and left there when finished until dry.

Scumbling and Wiping Out.—Relief work may be enriched and the occasionally garish brilliance of the coloured lacquers used for decorative purposes may be subdued by a free use of dull "*scumbling*" in either water or oil colour (usually of umber, burnt sienna, blue or black), all over the surface after the lacquering is dry, "*wiping*" off at once with sponge and wash-leather, for water colours, or a pad of soft calico for oil colour, all that will come off the high relief parts with gentle rubbing, during which the sponge or cloth must be frequently cleansed or renewed.

A similar effect can be obtained and cloudy effects added by "*smoke glazing*," *i.e.*, causing the black smoke from a paraffin lamp to be deposited more or less all over, and wiping off the high relief parts. This is chiefly useful on silver or aluminium surfaces finished with clear lacquer. White metals so treated make a happy change from gold for certain decorative purposes, such as frieze and moulding work, door panels, Florentine picture frames, etc. (being wiped off prominent parts).

BLUE LACQUER requires a ground of silver or other white metal as yellow metal gives it a green appearance.

Much of the value and effect of metalled and bronzed decoration depends upon the quality and colours of the lacquer, and its successful application. The colours range from merely tinted liquids down to deep shades competent to entirely alter the apparent nature of the metal, silver and white metals becoming rich gold, copper or brilliant coloured metals in appearance. This is largely taken advantage of in the finishing of "*capsules*" *for bottle necks, etc.*, composed of lead or tin foil, and similar coverings for confectionery packages, smallware goods, and many other articles in addition to the decorative materials already mentioned.

BROKEN COLOUR EFFECTS of rainbow-like variations and brilliance, or more subdued, can be obtained by various methods of dispersing these coloured lacquers over the surface while all wet, which requires exceptional dexterity, but repays an artistic manipulator in the luxurious richness of the effects he can produce in endless variety very suitable for backgrounds to relief or stencilled ornament.

RE-LACQUERING.—Old brass or bronzed ornaments and fittings require occasional re-lacquering to renovate, though sometimes a cleansing with weak *aqua fortis* or vinegar will effect all that is required. In case of re-lacquering first cleanse in the manner named and then remove all traces of the old lacquer by rubbing with a cloth saturated with alcohol. If difficult of removal it will assist the operation to heat the article before rubbing with the spirit. Cleanse the metal by another application of weak acid, and then burnish and re-lacquer as already directed for those processes.

There is no reason why the arts of gilding, bronzing and lacquering should not be practised with more striving after novelties quite possibly of greater extension than has hitherto obtained, and the author hopes that the usefulness of this handbook will assist the practical reader to extend the application of these arts, with such display of originality as frequently the individual craftsman can bring to bear.

CHAPTER XII.

MEASURING AND ESTIMATING.

THERE are so many methods of gilding, and such extensive varieties of surface, embellished to widely different degrees by gilding, that only in a few well defined directions can any list of prices be adequately scheduled.

Lettering, lining, plain backgrounds, whether on wood, on stone, on glass, or other surface, may be regulated by the prices set out below, and all preparation of surface that may be requisite is chargeable as an extra according to time and material required for its accomplishment. The prices given are merely for the actual sizing, gilding, and proper finishing of the gilded work.

Water gilding is the most costly, as will be understood from the processes described in an earlier chapter, best work being generally double gilded. Oil and japanners' gilding are generally of uniform value. Ordinary lettering whether of plain or common "fancy" types, are usually charged at uniform rates, including such types as Egyptian block, Roman, Gothic, French, and script. But very fancy types, such as old English capitals, intricate church text, etc., are chargeable at rates varying from one-third higher to double the prices scheduled below.

In measuring letters, no account is taken of the punctuation marks nor of fanciful tails of such letters as R, S, J, etc., often used in quaint types, nor of the heads and tails of "lower case" types, though the small letters, such as "o," sometimes placed among larger ones, as in old Roman types, are counted as equal to those surrounding.

Ornamental stencilled work, such as corner pieces, breaks, panels and pilasters, in common with gilded enrichments to plaster cornices, mouldings, carved work, etc., is all chargeable at the rates given "per book" of metal used, or per *square foot* of surface gilded.

Gilded backgrounds are charged at the rates given per square foot.

Picture frames vary so much in their requirements and intricacy that it is practically impossible to lay down any list of prices that will be adequate to meet all cases, though by omitting the question of repairs (always a serious item when necessary), and varying considerably with the style of frame and its condition, a system is here suggested which will cover the legitimate charges for the gilding alone with fair certainty of reasonable profit.

Lines, beadings, fillets, and plain mouldings are charged at prices per lineal yard or foot according to breadth of line.

In the following schedule of prices no account is taken of any scaffolding or other difficulties of access which are chargeable extra.

In lettering there may occasionally be a diversion from the prices given, where such letters as "hair line" italics or extra heavy block letters cause considerable modification or increase in the quantity of gold required to cover them.

The charges named for ornamental stencilling, etc., includes the use of designs and stencil plates, but in special cases where these are to be specially designed for the exclusive use of a client they may become an extra charge.

All prices are gauged from those generally obtaining in Great Britain, and are subject to modification as may be necessary to suit the different conditions ruling in other countries.

Schedule of Prices (for Gold Leaf) Gilding in oil, Japanners' Goldsize, Writing Size, etc.

Lettering—

Letters of 1 inch height and under, per letter, 1½d.
Letters over 1 in. height, up to 6 in., per in., 1½d.
Letters over 6 in. height, up to 9 in., per in., 2d.
Letters over 9 in. height, up to 12 in., per in., 2½d.
Letters over 12 in. height and over, per book of gold used, 6/-.

Highly ornate lettering, such as Old English capitals, are charged at rates ⅓ *higher* than above-named.

Shading, *Raising or Outlining*, in gold are each charged as lettering in addition to any painted work.

Elaborate Capitals, *Monograms*, *Crests*, *or Initial Letters* are charged according to the time involved in designing and execution.

Lining, Beadings, Flats, or Plain Mouldings—

Width, ½ in. or under, per foot run,	2d.
,, 1 ,, ,, ,,	3d.
,, 1½ ,, ,, ,,	4d.
,, 2 ,, ,, ,,	6d.
For every additional ½ in. width, add ,,	2d.

Enriched Mouldings. Carved and Cast Work, etc.

1 in. girth (solid gilding)	9d. per ft. run
Ditto (faced only)	4½d. ,,
2 in. ditto (solid gilding)	1/- ,,
Ditto (faced only)	6d. ,,

Add for each extra inch girth (solid gilding) 6d. per foot run.

Ditto (facing gilding) 3d. per foot run.

For extraordinary enrichments or such as are sparsely or irregularly picked out in gold. 4/6 to 6/- per book of gold used.

Solid Backgrounds, measured "over all" 3/- to 4/6 per square foot.

MATT AND BURNISH GILDING.

Whenever applied to such work as above, should be charged at *double the rates* quoted, as it is usually *double gilded*, and any "bodying up" done should be charged in addition according to time and material employed, but the necessary coats of matt size are included in the price of the gilding.

GILDING ON GLASS.

The rates for *best quality* of gilding on glass (which is always *double gilding*), are double those above quoted for oil gilding.

For second quality (one coat work, "faulted,") the usual charges are one and a half times the quotations given for oil gilding.

In both cases all necessary "fixing" and background coats are included.

Frame Gilding.

Such extensive variety of detail and consequent variation of time and material employed, is experienced in this department, as well as the various "condition" of old frames that have to be repaired where necessary before re-gilding, that it is not possible to schedule any adequate list of prices. The repairs may be charged separately or included in the "lump sum," usually quoted after overhauling each frame separately. Only experience can enable a workman to estimate in advance for the repairs. The time and material that will be required in the gilding also depend so much upon the depth and design of enrichments, that any prices recommended here must necessarily be subject to variation according to these details, which the practical man can readily gauge on seeing the frame. Prices are also affected by the distribution of the three methods of gilding generally employed. If the matt or the burnish gilding be required upon spaces between parts gilded in oil, the cost goes up on account of the extra time and care necessary.

A fair average of the prices charged by the best London gilders, for gilding alone (including only the sizing and finishing), works out at from 4/- to 6/- per square foot for oil gilding, and from 7/6 to 12/-

per square foot for matt and burnish gilding, the latter being for best double gilding upon broad surfaces and the former for re-gilding where the previously matted surfaces offer little or no obstacle to straightforward work upon mouldings of moderate width.

Measurements for these averages are taken by the full outside length of frames all round being multiplied by the accurate measurement across the mouldings taken in and out of all moulds, fillets, etc.

Gilding on leather, paper, cardboard, etc.—If in oil the charges are as for oil gilding, and if in water, matt, or burnish gilding, as for frames, and if done by die press or "blocking," the price charged is usually at the rate of 4/6 per book of gold used, in addition to the cost of dies.

When *ribbon gold* takes the place of book gold, calculate ten books for every (67 ft.) roll of ribbon, 3¼ in. wide, or less *pro rata*, as the width of ribbon diminishes.

Gilding in Silver, Aluminium and Copper.

By all methods the use of these metals in the place of gold reduces the prices chargeable to one-third lower than prices quoted for gold leaf.

Gilding in Gold Imitation, Dutch Metal, etc.

The prices chargeable for work executed in these metals generally includes "lacquering," and is chargeable at half the rates above quoted, when lacquered, though for extensive surfaces the cost can be so minimised as to make even one-third the price of gold leaf a profitable charge to make. Lettering (seldom now done in these metals) is charged one-third lower rates than those quoted for gold leaf, and includes lacquering.

BRONZING.

The charges for bronzing (and lacquering) are usually about treble that of a coat of paint for plain work, and for antiques, or artistic work in varied colours, well lacquered, the prices obtainable are higher, not infrequently reaching the price of gold leaf work when results are specially good.

LACQUERING.

When this process is charged separately its value is gauged by the quality of lacquer and time occupied in its application. It should carry a substantial profit of at least 30 per cent. on account of the volatile nature of the lacquers and consequent wastage, also because of the special risks explained in a previous chapter.

MEASURING.

In most cases a 10 per cent. margin on architects' measurements should be allowed in favour of the gilder, to compensate for unavoidable loss of gold in wastage during application, and should be stipulated for by the gilder in advance when working to a schedule upon a job where any considerable quantity may have to be measured.

INDEX.

PAGE.
Abyssinian Gold .. 26
Alabastine.... .. 59, 60, 157
Alloys .. 13
Aluminium Bronze .. 157
,, Gold .. 26
,, Leaf .. 24
,, Paint .. 154
,, Powder .. 15
Antique Bronze .. 14
,, Effects .. 155
Appliances .. 44
Applying Bronze Powders .. 141
,, Speckles .. 151
,, Transfers .. 138
Ardenbrite .. 29, 154

Badger Tools .. 47
Bag, Skewing .. 53
Bevelled Lining Fitches .. 47
Black Japan .. 42
Blinds, Wire .. 69
Blocking Gold .. 126
Blocking Powders .. 37
Blue Bronze.. .. 14
,, Lacquer .. 163
Boats .. 72
Bodying Up.. .. 108
Bookbinders' Cloth .. 73
Book Edges.. .. 73
,, Gilding from .. 139
Brocade Speckles .. 15
Broken Colour Effects .. 163
Bronze Iron Railings .. 156
,, Lettering .. 156
,, Paint, To make .. 29
,, Medium .. 30
,, Painting .. 149, 154
,, Powders .. 13, 27, 141
,, Bright .. 14
,, Stencilling in .. 156
Bronzed Lettering .. 156
,, Plaster Casts, Lacquering .. 160
Bronzing .. 149, 171
,, Antique Effects .. 155
,, Applying Speckles .. 151
,, Iron Railings .. 156
,, Liquid .. 30
,, Tools for.. .. 54
Bronzes, Antique .. 14
,, Coloured .. 14
,, Patent .. 14
,, Selection of .. 152

PAGE.
Brown Sable Liners .. 56
Brushes .. 45
Buffalo Hide Size .. 40
Bundle Metal .. 25
Burnishers .. 54
Burnish Gilding .. 118
Burnish Size .. 35
Burnishing Tools .. 55

Camel Hair Dabbers .. 47
,, ,, Mops .. 55
Cardboard Mounts .. 125
,, and Parchment .. 65
Carriages .. 71
Carton Pierre .. 69, 123
Ceilings .. 69
Cement. Parian or Keen's .. 59
Citron, Bronze .. 14
,, Gold .. 18
Clearcole .. 66
Clearcoling .. 108
Clear Size, Finish .. 40, 109
,, Gilding .. 124
Cloth Surfaces .. 65
Coe's Gilding Brush .. 146
Coe's Gilding Wheel .. 144
Coe's Ribbon Gilding .. 142
Colour Effects .. 163
Compo .. 66
Composition Metal .. 26
Compo Repairs .. 120
Copper Bronze .. 14
,, Leaf .. 27
Cotton Wool .. 47
Crimson Bronze .. 14
Cushion, Tip and Knife .. 47

Dark Blue Bronze .. 14
Deep Gold Leaf .. 18
Design .. 104
Direct Fixing .. 103
Distempered Surfaces .. 65
Doors .. 69
Doubling Gilding .. 101
Ducat Leaf .. 26
Dutch Metal .. 25, 26

Editor's Introduction .. 5
Egg Size .. 36
Ellamite .. 29, 154
Emergency Process .. 104
Enamelled Work .. 58
Estimating .. 165

PAGE.
Extra fine Bronze Powder 13
Extra Superfine Bronze Powder .. 13
Extra Deep Gold Leaf 18

Fab-ri-ko-na 61
Fat Edges 78
Faulting 101
Fine Bronze 14
Fire Bronze 14
Fitches Bevelled Lining 47
Fixing 102, 103
Flatting Paint 57
Florentine Lacquers 39
Foreign Gold Leaf 21
Frame Gilding 107, 169
French Burnish Size 35
,, Polished Work 65
Frosting 15

Gelatine Size 41
Gesso Work 59
Gilders' Clay 41
,, Cushions 47, 48, 55
,, Knives 47, 48, 52, 55
,, Tips 47, 50, 55
Gilding, Brush, Coe's 146
,, Burnish 118
,, Clear Size 124
,, Double 101
,, Frame 107, 111
,, from the Book 139
,, Glass 87
,, in Aluminium 170
,, in Gold Imitation, etc. .. 170
,, in Silver, etc. 170
,, Matt 115
,, Oil and Japanners' 74
,, on Glass 168
,, on Leather 125
,, Powder 129
,, Processes, Metals used in .. 13
,, Railway and Carriage .. 128
,, Ribbon 140, 142
,, Transfer 137
Glair 41, 45
Glass 70
,, Gilding 70, 87
,, Gilding peeling off 106
Glossana 29
Gold 14
,, Backgrounds, Plain 105
,, Beating 16
,, Blocking 126
,, Enamel 154
,, Imitation 26, 27
,, Leaf 16
,, ,, Foreign 21
,, ,, Handling 20
,, ,, Special Qualities 15, 17
,, Mosaics 71
,, Paint 28, 154
,, Powder 21
,, Retainer 30

PAGE.
Gold Size, Japanners 31
,, ,, Matt 34
,, ,, Old Oil 30
,, ,, Writing 32
,, Substitutes 25, 26, 27
,, Tablets 22
,, Transfers 19, 128
,, Varnishing over 81
Granite 62
Green Bronze 14
,, Gold 18
Ground Glass 70
Gum Water 36

Hand Laying 140
Handling Gold Leaf 20
Hein's Matt Size 43
Heliotrope Bronze 14

Introduction 5
Imitation Gold 26, 27
Iron Railings, to Bronze 156
Iron Surfaces 62
Isinglass Size 33

Japan, Black 42
Japanners' Gilding 33
,, Gold Size 31
Jewelling Cement 36
Jewelling 15

Keen's Cements 59

Lacquering 159, 171
Lacquer, Blue 163
Lacquering, Broken Colour Effects .. 163
,, Bronzed Plaster Casts .. 160
,, Brushes 56
,, Tools for 55
Lacquers and Sundries 37
,, Oil 42
,, Prices 39
,, Spirit 37
,, to make 38
Lead Pencils, etc. 72
Leaf Metals 16
Leather 72
,, Gilding on 125
Lemon Bronze 14
,, Gold 18
Lettering, Bronzed 156
,, Lining, etc. 165
Liners, Brown Sable 56
Lining Fitches 47
Litho Bronze 14

Marble Surfaces 61
Materials 13
Mauve Bronze 14
Matt and Burnish Gilding 168
,, Gilding 115
,, Gold Size 34
Measuring and Estimating .. 165, 171
Medium Gold 18

PAGE.
Metallic Cut Speckles 15
Metals used in Gilding Processes .. 13
Methods of Application 131
,, Oil and Japanners' Gilding .. 74
Miscellaneous Methods 124
Monogram Bronze 13
Mordants 30
Motor Cars 71
Mouldings, Doors, Ceilings, etc. .. 69
Mounts, Cardboard 125

Oil and Japanners' Gilding, Method .. 74
Oil Gold Size 3
Oil Gilding Frames 112
,, ,, Processes.. .. .. 74, 76
Oil Lacquers 42
Old Oil Gold Size 30, 77
Orange Bronze 14
,, Gold Leaf 18
Ormolu 39, 115
,, Sizing 115
Outside Gilding 53
Outlining 82
"Oyama" 29

Painted Surfaces 57
Paint Varnished 58
Palmer's Jewelling Cement 36
Paper Surfaces 65
Papier Mache 123
Parchment Size 40
,, Surfaces 65
Parian or Keen's Cement 59
Patent Bronzes 14
Pavitt's Venetian Lacquers 39
Peeling Off 106
Pencils, Lead, etc. 72
Perfect Bronze 14
Picture Frames 66
Pink Bronze 14
Plaster and Cement Surfaces 59
Platinum Leaf 23
Polishing 97
Powder Bronzing 141, 149, 153
,, Gilding 129
,, Gold 21
Pounce Bags 44
Preface 7
Preparation of Surfaces 57
Prices of Tools for Lacquering .. 55
,, Lacquers 39
Printers' Bronzing 150
Pure Gold Leaf 18
,, Metals 13
Radiators 64
Railway Carriage Gilding 128
,, Cars, etc. 71, 73
,, Coaches, etc. 71
Red Gold Leaf 18
Re-lacquering 163
Relief Materials 61
Repairs Compo 120
Ribbon Gilding 140, 142
,, Gold 20

PAGE.
Roughened Surfaces 61
Russian Isinglass 33

Seccotine 36
Second Coating 101
Selection of Bronzes 152
Shell Speckles 15
Schlag Metal 25
Scumbles, Water 41
Scumbling 162
Shading 82
Shell Gold 22
Shell Gold 22
,, Speckles 15
Ships and River Boats 72
Silk Surfaces 65
Silver Bronze 14
,, Leaf 23
Size, Burnish 35
,, Clear 40, 109
,, ,, Gilding 124
,, Gelatine 41
,, Isinglass 33
Sizes, Water 33
Sizing, Ormolu 115
Skewing Bag 53, 114
Sling Box for outside Gilding .. 53
Spangles 15
Speckles 15
,, Applying 151
,, Brocade 15
,, Metallic Cut 15
,, Post Card Jewelling .. 15
,, Shell 15
,, White Frosting 15
Spirit Lacquers 37
,, Varnish 36
Sponges and Washleathers 53
Steel Green Bronze 14
Stencilling in Bronze 156
Stone, Marble and Granite 62
Stopping 110
Superior Bronze 14
Surface, Roughened 61
Surfaces, Bookbinders' Cloth.. .. 73
,, Cardboard, etc. 65
,, Carton Pierre 69
,, Ceilings 69
,, Clearcole 66
,, Compo 66
,, Distempered 65
,, Enamelled Work 58
,, Fab-ri-ko-na 61
,, French Polished Work .. 65
,, Gesso Work 59
,, Glass 70
,, Ground Glass 70
,, Iron or other Metals .. 62
,, Lead Pencils 72
,, Leather 72
,, Mouldings 69
,, Natural Wood 64
,, Painted 57
,, Paper 65

PAGE.
Surfaces, Picture Frames 66
,, Plaster and Cement 59
,, Preparation of 57
,, Railway Coaches, etc. .. 71
,, Ships, Boats, etc. 72
,, Stone 62
,, Varnished Paint 58
,, Walls 69

Textile Fabrics 65
Thick White 110
Tin Leaf 24
Tip Gilders 47
Tip and Cushion 48, 50
,, ,, Method 131
Tools and Appliances 44
,, for Bronzing 14
,, for Lacquering 55
,, Prices of 55
Tramway Cars 71
Transfer Gilding 137
Transferred Gold 19
Transfers, Applying 138
Trimming 98

PAGE.
Varnished Paint 58
Varnishing over Gold 81
Velvet Bronze Powder 14

Violet Bronze 14
Waggons 71
Walls, Mouldings, Doors, etc. .. 69
Washing, Water Gilding 119
Washleathers and Sponges 53
Water Gilding 87
,, ,, To Wash 119
,, Scumbles 41
,, Sizes 33
White Gold Leaf 18
,, Frosting 15
,, Thick 110
Whiting 41
Wiping Out 162
Wire Blinds 69
Wood Surfaces 64
Writing Pencils, Red Sable 56
,, Gold Size 32

Xylonite Lacquers 39

"THE DECORATOR,"

Edited by ARTHUR SEYMOUR JENNINGS.

The leading journal for Painters, Decorators, Sign Writers, Grainers, Builders and others. Published on the 22nd of each month.

Price 6d. Subscription 5/- per annum, including Diary and Trade Year Book. Send for Sample Copy—

TRADES PAPERS PUBLISHING CO., LTD.,
365, Birkbeck Bank Chambers,
High Holborn, London, W.C.

WILKINSON, **ESTABLISHED 1796.**

HEYWOOD

GOLD MEDALS,
PARIS,
1878—1900.

& CLARK,

. . LIMITED,

MANUFACTURERS OF

High Class Varnishes, Japan,
Gold Size, Colours, etc.

GOLD SIZE Specially prepared for Gilders.

Quick	-	Dries in about 2 hours.
Medium	-	,, ,, 8 ,,
Slow	-	,, ,, 24 ,,

Extra Pale, Tough and Durable Varnishes for Sign Boards, in Three Shades.

GOLD LEAF. OIL GOLD SIZE.

Gold, Silver, Copper and other Bronzes and Lacquers.
Gilders' Knives, Tips, etc., always in stock.

7, CALEDONIAN ROAD,
LONDON, N.

IMPORTANT TO GILDERS & DECORATORS.

HEIN'S Celebrated American

GILDERS' GOLD SIZE,

OIL, BURNISH & MAT.

PRODUCES THE MOST BRILLIANT GILDING.

American Burnished Gold Size,

or "**Gilders' Delight,**" is superior and goes further than any other known in the market. Twenty-five per cent. of time is saved on labour in using this **splendid Burnished Size.**

The Premier Oil Gold Size

is a very superior article, ready for use, not affected by the weather, and will hold its tack for days. Entirely free from grit, and acknowledged by all who have used it as the Best.

The Yellow Mat Gold Size

is procured from a vein of earth only found in America, and which is invaluable as a Gilders' Preparation.

PRICES: Burnished, 1/9; Yellow Mat, 1/6; Oil, 2/6 per lb.

Silver Leaf Gilding,

Will not Bloom or Oxidise; will keep its colour for ever.

White Oil, 3/6; per Pot LEAF, 7/- 1000; Enamel, 4/- Pint.

Ducat Gilding Substitute for Gold Leaf.

2/- per Pot; LEAF, 4½×4½, 10/- 1000; Enamel, 3/- Pint.

Ardenbrite, the King of Gold Paints.

Washable, Untarnishable, Warranted.

8/- per Pint net.

GILDERS' BRUSHES OF ALL KINDS MADE.
CUSHIONS, TIPS, KNIVES, Etc., Etc.

Sole Agents:

THOS. PAVITT & SONS,

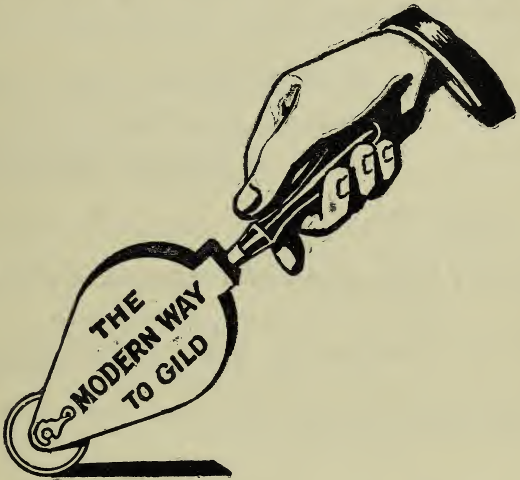
Artists' and Paint Brush Manufacturers,

69, SOUTHAMPTON ROW, LONDON, W.C.

COE'S GILDING WHEELS

AND

COE'S RIBBON GOLD LEAF



COE'S GILDING WHEELS DO YOUR GILDING FIVE TIMES QUICKER THAN THE OLD WAY AND STOP ALL WASTE. SOMETHING YOU NEED!

SEND FOR A CATALOGUE.

W. H. COE Manufacturing Co.
London Offices:
27 & 28, Birkbeck Bank Chambers, High Holborn, W.C.

BUY YOUR

Telephone No. 1458.
Telegraphic Address:
"Goldleaf, Manchester."

GOLD LEAF

Direct from BONA FIDE Manufacturers and thus be sure of obtaining the best possible value for your money.

WE MANUFACTURE MORE GOLD LEAF THAN ALL THE OTHER MAKERS IN THE NORTH OF ENGLAND COMBINED.

Write or Samples and Prices to

JAMES SMITH & SON,

GOLD LEAF MANUFACTURERS,

39 & 41, Bridge Street, MANCHESTER.

Also Importers of Gold Leaf, Bronze Powders,
Aluminium and Metal Leaf, etc., etc., etc.

GOLD PAINT,

ETC.

Our "OYAMA" Bronze Powders and "OYAMA" Medium make the finest Gold, Aluminium and Copper Paints yet placed on the Market.

Samples and Prices on application to

JAMES SMITH & SON,

39 & 41, Bridge Street, MANCHESTER.

W. H. PALMER & Co.

MANUFACTURERS OF ALL KINDS OF

Lacquers and Varnishes,

COLOURS, ENAMELS,

PAINTS AND STAINS

OILS, CHEMICALS, GUMS, GLUES, GELATINES,

Gold, Silver & Metal Leaf,

Bronze Powders,

MAT, BURNISH AND OIL GOLD SIZES,

Gilders', Decorators' and Artists' Colours,

BRUSHES, TOOLS AND MATERIALS.

WRITE FOR LIST 65 FREE.

82 & 84, OLD STREET,

LONDON, E.C.

Telephone 1635 London Wall. **Telegrams: "Palmkermis, London."**

ESTABLISHED 100 YEARS.

ESTABLISHED A CENTURY.

REGISTERED TRADE MARKS.

W. M. WHEATLEY & SONS,

Contractors to H.M. Government.

GOLD & SILVER BEATERS,

Devonshire Street, LONDON, W.C.

Gold Leaf in all Shades. Speciality—Fine Gold Leaf for Glass Writers. Transfer Gold for Outside Gilding. Bronze Powders in all Colours. Metal Leaf, Platinum, Aluminium, Oil Gold Size, Burnish, Matt Tips, Cushions, etc., etc.

GOLD LEAF.

Best Foreign in all Shades and Sizes.

SPECIALITY, "STERLING," 42/- per 1000. Best in the Market.

SILVER, ALUMINIUM AND METAL LEAF.

BRONZE POWDERS.

"SUKI" (Anti-Tarnish) BLOCKING POWDERS, GOLD PAINT, "JEWELLING POWDER" (Speckles).

Wholesale Inquiries Solicited.

E. WINTER & CO., Telephone 985 Central.

64 CHEAPSIDE, LONDON, E.C.

WRIGHT & BULL,

SUCCESSORS TO THE OLD FIRM OF

JOSEPH LANE & SON,

GOLD LEAF MANUFACTURERS,

93, Irving Street, BIRMINGHAM.

GOLD LEAF, etc., supplied in small or large quantities at cash price, per post.

TO GOLD PAINT MANUFACTURERS.

Untarnishable, Water White

Medium for Gold Paint,

Water White and Gold Tinted.

(MANUFACTURERS TO THE TRADE ONLY.)

THE WESTON MANUFACTURING CO.

CLAPHAM, LONDON, S.W.

FOR GILDING USE OUR 'A1' GOLD LEAF,

CUSHION OR TRANSFERRED,

IN MANY SIZES,

Interior Gilding with "GLOSSANA" Gold Enamel gives perfect results and lasting satisfaction.

Write for Particulars of Specialities—

REINEMANN & CO.,

7, NEW ZEALAND AVENUE, BARBICAN, LONDON, E.C.

COLD LACQUERS.

"ZAPON" Enamel, ***"BRASSOLINE,"***

"ENAMELOID," ***"GOLD DYE" Process,***

For Brass, Electro-Brassed, Copper, Silver, Art Metal Work (Iron), etc., etc.

Sole manufacturers of the above **WELL KNOWN** and **WIDELY USED** Lacquers—

THE FREDK. CRANE CHEMICAL CO.,

22 & 23, Newhall Hill, BIRMINGHAM.

PHILIP W. MARSHALL, Resident Manager. Write for Trade List and Samples.

The Robinson Printing Company, Ltd., 1, Lombard Court, London, E.C.

DATE DUE

FEB 0 6 2004			

HIGHSMITH #45102

UNIVERSITY OF ILLINOIS-URBANA
3 0112 001432373